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Water Works Rules and Regulations

By Melvin P. Hatcher

A paper presented on July 22, 1947, at the Annual Conference, San Francisco, by Melvin P. Hatcher, Director, Water Dept., Kansas City, Mo.

THE water works industry is striving right now to improve its technique in public relations matters. Procedural awkwardness and lack of consistency in matters involving contacts between the water works properties and their customers are likely to be a serious deterrent to any progress in this direction. Faulty operations may be overcome only if the employees and the management know the answers to customer contact problems. This principle, in turn, means that the answers to the main problems must be written down in black and white.

In brief, this is the argument favoring water works property rules and regulations. Existing rules vary widely in scope, arrangement, formality and the degree of perfection attained. It is likely that the larger properties have greater need for written rules than do the smaller properties. Yet it appears that few of the former have revised their regulations in the last five or ten years. It is obvious that these rules need frequent revision if they are to serve adequately. These considerations, together with the fact that the whole subject seems to deserve more attention than it has been given, have prompted the author to undertake this paper.

It should be said at the outset that the water works property rules and regulations must be regarded as a formal document. They will be referred to in most service contracts, but even if not mentioned, they are likely to be a part of the contract. They may not exist as a document, or, if they do, they may be used formally only on rare occasions. In any event, they are undoubtedly a part of the utility's contract with its customers.

Most rules and regulations include detailed statements of rates for service, billing and collection, meter installation and repair, and other important practices, although, as will be more fully discussed later, the organization or arrangement of these rules follows no generally accepted pattern. Beyond providing thoroughly for some of the more important practices, a varied amount of attention is given to minor items which can be rather troublesome and with which the water works management in every locality is called upon to deal from time to time, such as the problems involved in the prohibition against services laid across one private property to reach another, the prohibition against more than one service into any one building and similar matters that tend to add to the difficulty of orderly administration.

As a class, these problems are related in one way or another to the arrangement of services and meters and, in a lesser degree, to interior piping on the customer's premises. It may not be extremely important whether they are covered in a formal document, but it is necessary that the utility have a solution for each of them which will consider the customer's point of view. There is little in water works literature to indicate industry-wide concern with these problems. Most properties have evolved their own practices out of their individual experience. Some excellent advice concerning interior piping has been provided in the handbook, "Water-Supply Piping for the Plumbing System," prepared by the National Association of Master Plumbers (1). No study of equal competence has been made of the many difficulties with the arrangement of services and meters. *Water Works Engineering* has rendered excellent service to the industry through its "Question and Answer" section on operating problems, but there are quite a few rules and regulations problems that cannot easily be disposed of in this way. They need more generous treatment with illustrations and reports on the effect of some of the bad practices.

The author sought answers to a number of the questions just described, as well as information on the whole subject of regulations, from about fifteen of the larger water works properties. Of these, only two replied that they had no printed rules and regulations, and nearly all responses included some interesting comments on the need for them. The material to follow comprises a digest of the questionnaire replies and the author's observations on some of the problems that have been encountered in Kansas City in the last six or seven years.

Value of Written Rules

Is a written set of rules and regulations essential to the orderly administration of matters involved in the contacts of the water works properties with their customers? Is such a set of rules necessary for a proper understanding between the utility and its customers? Should not each water works utility provide itself with rules and regulations in document form in order to have them available for reference against complaints about any practice or for use as evidence in any court action questioning the utility's authority? Finally, would not such rules be a means of insuring employee acquaintance with practices and procedures?

None of the fifteen water works managers who replied to the questionnaire was willing to deny that written

rules were necessary, although two indicated that they did not have them. One said he had found little need for a complete re-compilation of rules last assembled in 1927, and a few others stated that they were using rules which had not been brought up to date in the last ten years. Nearly all of the replies stressed the need for rules, citing one or more of the reasons given in the paragraph above.

In the author's opinion, written rules and regulations are important tools for the operation of a water works utility, although the degree of their value is probably related to the size of the property. The requirements of a smaller property may be very well satisfied by a set of rates and unassembled rules on such fundamental matters as main extensions and meter and service ownership and maintenance. As the number of operations increases with size, it becomes more and more necessary for management to establish rules and regulations which will provide a ready answer for all except a small percentage of the customer contact problems that arise.

First things must come first, however, and there is always plenty of administrative detail to demand the attention of management. It must be admitted that most properties have not found it necessary to place major emphasis on rules and regulations. Many apparently operate with rules that have been outgrown and are overrun with practices established by precedent or administrative order. Probably the point to be stressed is that the compiling of rules and regulations requires a study and review of all utility-customer contact problems in addition to those involved in the installation of mains, services and meters. The rules will have achieved one of their main purposes if their compilation and continued revision have caused management to make the necessary studies of all of these practices.

Scope and Purpose

What should be the scope and purpose of the rules? Into how much detail should they go in defining the utility's and the customer's respective rights and obligations?

The main purposes of rules and regulations are quite clear: to complete the service contract with customers, to set forth the conditions of service, to state the utility's obligation to the customer and the reverse, and to cite the utility's authority for its prohibitions and requirements. Their scope is not so readily defined. Rates, billing practices, service and meter ownership and maintenance, discontinuance and restoration of service, access to premises, and matters of similar basic import are included in nearly all rules and regulations. Considerable differences occur in the manner in which various utilities deal with interior piping on the customer's premises and in the treatment and the amount of attention given to provisions for the orderly and administrable arrangement of mains, services and meters. Those parts of the rules and regulations relating to items in the latter category deserve, in a way, to be set apart from the fundamental matters referred to above. They are less important in the sense that they may very properly be covered in administrative orders, with only the authority for such orders written into the main body of the regulations.

The term "main body" is meant to apply to that part of the rules and regulations which is passed on formally by some ruling authority; the

portion fixed by ordinance, for example, in municipally owned water works properties, or the part approved by a public utilities commission in some privately owned utilities. Setting the minor elements apart from the main body makes it unnecessary for changes in the former to have the approval of the governing authority.

A description of the plan for Kansas City's rules will help to explain the point just made. The main controlling ordinance covers only the basic subjects previously noted, such as rates and billing practices, but it includes the provision that the director may make rules regarding the arrangement of meters and services and may fix the prices of work done for customers or others. The director's rules, in turn, refer to standard drawings for services and meter settings, thus overcoming the need for verbal descriptions of these facilities and the materials going into them. Placing these matters apart from the main ordinance gives them a desirable degree of flexibility.

Water works rules may exercise direct control over whatever aspect of interior piping on the customer's premises concerns the water supplier: cross-connections, back siphonage, and temperature and pressure relief devices. Alternatively, this control may be provided for in a building code administered by the city, for privately owned properties, or by a city department (generally, the public works department) other than that of water supply, for a municipally owned property.

Many questions are raised about the minuteness of detail with which practices dealing with interior piping or the arrangement of meters and services should be described. To meet these problems, each water works property should have clearly defined solutions which must be thoroughly understood and consistently applied by its employees. The final section of this paper deals extensively with these practices.

Standardization

Would standardized rules and regulations be an advantage to the water works industry?

The questionnaire replies agreed that the standardization of rules and regulations is impracticable because of the wide range of conditions encountered. At least two replies, however, approved the idea of "model" regulations. This suggestion has had at least one trial. The Maine Water Utilities Assn., in co-operation with the Maine Public Utilities Commission, has worked out model but flexible rules that apparently have served the purpose well.

Nevertheless, the author doubts that model rules could be made to justify the time and effort needed to create them, except for use by closely knit groups of properties having common problems. It appears that the most good could come from concerted effort if it were aimed at an agreement on an outline of the various procedures and a summary of opinions on specific practices based on experience with them.

Rules and regulations have certain logical subdivisions:

1. Fundamental matters such as rates, billing practices, service and meter ownership and maintenance, discontinuance and restoration of service, access to premises, misuse of hydrants, penalties for violations and the like.

2. Standard practice rules relating to the arrangement of mains, services and meters.

3. Prices on work performed for the customer or for others.

4. Water main extension rules.

In many rules all of these parts are commingled, although the fourth is more often treated separately. From the standpoint of their usefulness to the management that has prepared them, this is not necessarily a disadvantage, because the management knows, or should know, its own rules thoroughly. But water works managers seeking to use the rules of other properties as a guide to the formulation or revision of their own regulations could make more intelligent use of those that adhered to a more or less standard outline. Certainly, more progress would be made in the perfection of rules if there were less dissimilarity of outline.

The complexity of rules and regulations stems largely from confusing the first three subdivisions. If these are followed strictly, the subject becomes simplified. The first subdivision lends itself to arrangement under topical headings set up in logical sequence. The second can be brought together under three or four main headings. This outline plan will shorten the time needed to comprehend the rules. The reader will find it easier to digest them if he can discern the main outline and can feel that the material on any one subject is under one heading.

The force of this statement will be apparent to anyone reading a set of rules and regulations with the proposed separation in mind. Much of the difference in rules and in the range of items covered is centered in the second group. This subdivision has to do with the number of services that will be run to multiple-family dwellings or commercial buildings, the prohibition against the extension of services from one property to another and so forth. If the material in this category is set aside, the rules of the various water works properties will be found to differ to a much lesser degree.

TABLE 1

Topical Headings for Kansas City Rules

1. Water Funds
   - *a.* Water Fund
   - *b.* Water Debt and Interest Fund
   - *c.* Water Deposit Fund
2. Service Availability
3. Unauthorized Use of Water of Facilities
4. Water Rates
   - *a.* General Meter Rates
   - *b.* Suburban Meter Rates
   - *c.* Flow Line Rates
   - *d.* Temporary Service Rates
   - *e.* Domestic Flat Rates
   - *f.* Fire Protection Rates
5. Meter Reading and Billing Practices
6. Water Temporarily Unmetered
7. Bill Payment Guarantees
8. Service Connections to Mains
9. Water Service Maintenance
10. Water Service Disconnection
11. Water Meters
12. Access to Premises Served
13. Service Discontinuance
14. Water Hydrants
15. Water to Other City Departments
16. Misuse of Property
17. Price Schedules
18. Rules and Regulations
19. Penalty for Violations

To indicate that the first subdivision can easily be arranged by topic, the headings for this part of Kansas City's rules are listed in Table 1.

This outline aims at directness, logic and simplicity. None of the subject matter under the headings is burdened with the detail required for main, meter and service arrangements or for prices of work done, which are included in the second and third sub-

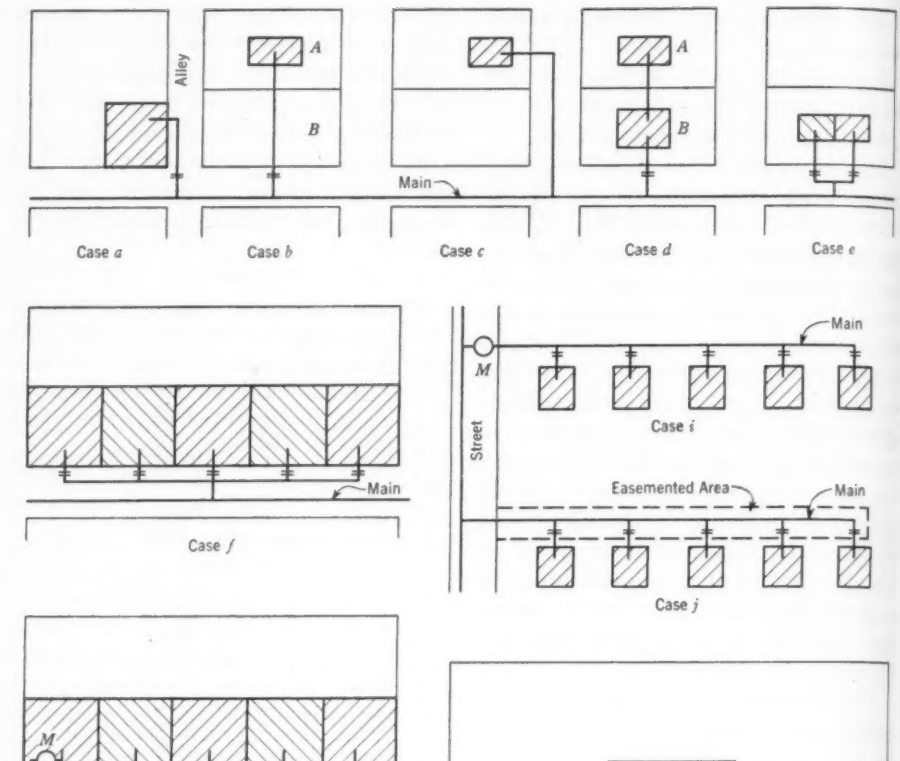

FIG. 1. Arrangement Practices

divisions previously described. These items are dealt with separately under the authority granted by "17. Price Schedules" and "18. Rules and Regulations" in the main controlling ordinance.

The conclusion, then, to the query, "Would standardized rules and regulations be an advantage to the water works industry?" is summarized in this way: Standardization is not a solution. The industry might profit from the formulation of model rules but just as much good would probably result from adherence to an outline coupled with more industry-wide studies of procedures for the arrangement of mains, services and meters.

Arrangement Practices

The remainder of this paper is devoted to a digest of replies to the questionnaire and to observations by the author on the arrangement of mains, services and meters. The list of problems and practices is not complete; almost any water works manager could think of others that he has encountered. The summary below will, however, serve to show the relationship of this part to the entire rules and regulations problem.

Services or private mains in alleys (Fig. 1, Case *a*). The question is whether it is wise or proper to allow services or mains to be laid in alleys. Permission to make a short extension into an alley, as shown in the drawing, could lead to extensions of greater length. In that event, the service takes on the character of a private main. Mains or services in alleys are difficult of access. Only a few of those replying approved the practice.

Service across private property (Fig. 1, Case *b*). Services across private property can be productive of trouble. Owner *A* could acquire the property without knowledge of the water service situation, and Owner *B* could deprive Owner *A* of water service unless the right-of-way across Owner *B*'s property were fixed by easement and recorded. Moreover, if there were no entry in the records revealing this irregular arrangement during a routine turn-on or turn-off of the water, the serviceman would have difficulty locating the curb stop serving Owner *A*. About one third of the questionnaire replies approved the practice, but then only if an easement is obtained.

Service along street axis (Fig. 1, Case *c*). Most rules prohibit this practice by providing that the service shall be connected to a main in the street abutting the premises to be served, within the limits of the property's footage on that street. It is also well to provide that the service from the main to the curb stop shall be laid normal to the main's axis. Approximately one fourth of the questionnaire replies, however, indicated approval of the practice. It appears that exceptions should be allowed where it is clear that no other customers will seek connection to the extended service.

More than one customer per service (Fig. 1, Case *d*). The dangers of having more than one customer per service are obvious. Owner *A* is wholly without rights of service and there is scarcely a way that they can be guaranteed to him. Premises *A* can be sold without the purchaser's knowledge of the service location. In a disagreement, both owners (or all the owners, if the service is extended to additional premises) will expect the utility to settle their problem. Only one reply indicated approval.

Double-header services (Fig. 1, Case *e*). Kansas City, with customer ownership of the service from the house to the main, has administered many double-header service installations with fair success, although in recent years only two-family residences have been permitted to run them. If there is failure to agree on joint replacement from the curb stop to the main, either or both customers are required to make new separate attachments. Kansas City has recently agreed to carry out all service maintenance from the main to the curb stop. Under this arrangement, the double-head service is encouraged, though it is necessary to limit the distance between curb stops (now 15 ft.) and to fix the relation between the distance from the curb stop to the building entrance and the distance from the building entrance to the main. If the distance is too great, the customer may ask for a new main-to-curb service when his own portion needs replacement. All but two of the questionnaire replies approved this practice.

Joint service branch to commercial buildings (Fig. 1, Case *f*). A joint service arrangement for commercial buildings near each other is more economical than separate services with two main attachments. Moreover, there is some advantage to the water works property, particularly if it is municipally owned, because the branch service reduces the number of openings in the pavement. If the practice is permitted, it is almost essential that the utility assume the responsibility for maintenance from the main to the curb stops. In addition, the utility should reserve the right to have attachments made on either end of the branch service. This brings it into the private main category and makes the whole practice a variant of the two-main plan. Only about one third of the questionnaire replies favored the idea. The author believes that thorough study of the practice would lead to its universal adoption, since it results in economies and serves a useful purpose.

An interesting sidelight on this practice is shown in Fig. 1, Case *g*. A person owning all the buildings served effected some savings in the cost of water by purchasing it through one meter at *M* over a new service marked *B*. The owner then connected the old branch service into his own distributing header and disconnected the old service at *A*. This procedure is of course wholly improper because of the use it makes of facilities on public property, but it does illustrate the need for rules that will anticipate and guard against such unusual practices.

Multiple metering (Fig. 1, Case *h*). *Should a single industry or institution owning buildings A, B, C, D, E be permitted to take water through more than one meter and service? Is it advisable to treat combined meter readings for billing purposes as though the water were delivered through a single meter? Should the industry be permitted to carry its own mains across city streets to effect this consolidation?*

These questions concern only a small number of the larger industrial or institutional customers and few rules and regulations deal with them adequately. The use of mains on more than one street or in more than one block is preferred by industries for whom reliability of service is important. Assuming that the rates for service are designed to assess the extra costs involved equitably, multiple metering is objectionable to the utility.

Changes in the quantities of water taken through the meters will make it extremely difficult to detect faulty meter registration.

Kansas City does not permit the practice in new installations. It has had experience with multiple-metering problems growing mainly out of the vacating of streets for certain sizable industries. It overcame one large industrial customer's complaint against service from a single main by allowing a battery meter setting with connections to mains on two streets. Questionnaire replies, however, approved the practice by a ratio of three to two.

Should the meter readings be combined for billing purposes? This, of course, has more to do with rates than it does with rules and regulations. Actually, under rate plans that do not provide for service charges, meter readings should be combined only if the meters are set in battery. The author favors a service charge on large meters as a means of curbing multiple metering and claims for combined meter readings.

Should the industrial customer be permitted to extend mains across city streets to effect the inter-connection of properties in two or more blocks? The questionnaire replies were about evenly divided on this point. Kansas City has allowed one such inter-connection, and the water main was laid in a tunnel under the street.

Purchase of water for resale (Fig. 1, Case *i*). The purchase of water through a master meter on public property, the distribution of the water through mains on private property and its resale on a metered or flat rate basis to individual customers is a procedure which the author doubts should be condoned at all, although about half of the questionnaire replies indicated approval. The owner of the distributing mains can withdraw from participation in the resale plan at any time. Property served can change hands without the purchaser's knowledge of the water service condition. Individual customers can be deprived of their water supply through no fault of their own and may find themselves without adequate means of correcting the trouble.

Present Kansas City rules prohibit the practice. A few such installations were made about twenty years ago, including one system installed by a real estate firm to serve about 100 homes in a low-value district. Recently, as the wrought-steel mains began to fail, the owner sought relief and finally gave notice of his intent to withdraw his guarantee of bill payment. It then became necessary for the city to install mains in city streets to serve the system's customers.

Utility ownership of mains on private property (Fig. 1, Case *j*). Utility ownership of mains on private property is a procedure which assumes that the utility will own and operate the mains in very much the same way that it operates them in city streets. The utility must therefore have a perpetual easement giving it the right to own, install, operate and maintain the main without liability for property damage of any kind. Consequently, the property owner must not be permitted to place buildings or other obstructions on the right-of-way.

The problem is one of orderly administration. It appears clear in a legal sense that the utility could make contracts for service with individual owners and could discontinue it by operating a curb stop, just as it does where the curb stop is on public prop-

erty. Periodic inspections would be needed to maintain right-of-way accessibility. Should the owner violate the easement, litigation might be required, tending to create a difficult public relations problem. Approximately one third of the questionnaire replies approved the practice. It is the author's opinion that the practice should rarely be permitted.

The matter of easements bears on another very important problem, illustrated in Fig. 1, Case *k*, which arises with much greater frequency than the preceding case. Customers find it difficult to understand why commercial services should not be connected to fire protection services on private property. This practice was not included in the questionnaire but the author has the impression that exceptions are seldom made to the rule that each of the two classes of service must have its own provision for shut-off on public property. Each service has its own contract; failure to pay the bill on one should not affect the other. A commercial connection to a fire protection service makes it impossible to use the detector meter on the latter. It is not possible to meter both services on the same meter in a satisfactory way. This situation could be overcome by easements containing the provisions previously described, but again they would create conditions practically impossible to administer. The author would favor this type of easement only very rarely.

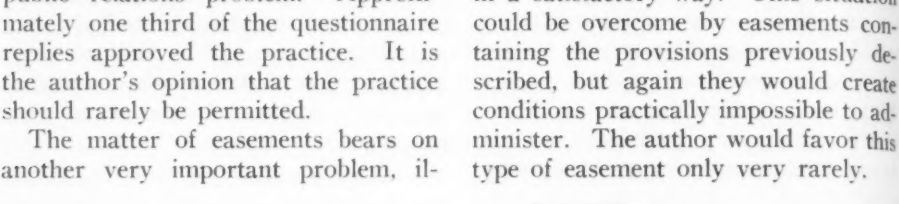

FIG. 2. Effect of Change in Type of Ownership

Kansas City has permitted one such easement to solve another type of problem. A multiple-family dwelling was originally built for single ownership with a single service and meter as shown (Fig. 2, Case *l*). Later the site was subdivided and the apartments were sold to a number of individual owners, each requiring a separate contract for water service. An easement was obtained from every owner for a water main across his portion of the court separating the two apartment structures (Fig. 2, Case *m*).

To emphasize the point that much is left unanswered in rules practices, the final problem presented concerns the limitations on the number of services per building. *Should each of the families in a two-family dwelling be allowed a separate service and be required to make individual contracts? What of four- and six-family dwellings?* Individual services to tenants on two or more floors of a commercial building pose a similar question. The author's present opinion is that the limitations are fixed by the number of stops that can be handled at the curb without too great a risk of confusion. Two services to a building are enough. Kansas City has one ten-family dwelling that insisted years ago on individual services, in which it is necessary to disentangle the inter-connections periodically. Buildings having more than two tenants should be required to make their own apportionments of the cost of water service.

In conclusion, it should be observed that there is more lack of uniformity than there need be in the rules bearing on many of these practices and that it surely would profit the industry to agree on many of them.

Reference

1. Dawson, F. W. & Kalinske, A. A. *Water-Supply Piping for the Plumbing System.* Natl. Assn. of Master Plumbers, Albany, N.Y. (1942).

Sponsorship of "Standard Methods"

Sponsorship of "Standard Methods for the Examination of Water and Sewage" will, in the future, include the Federation of Sewage Works Associations. The text has been jointly sponsored by the American Water Works Association and the American Public Health Association since 1925. Its first formal edition appeared in 1904, with George Warren Fuller as Editorial Chairman.

Hereafter the associations will operate through a Joint Editorial Board of three members, one representing each sponsor. As now set up the Editorial Board consists of:

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Business Principles in Water Works Operation

By Gerald E. Arnold

A paper presented on July 22, 1947, at the Annual Conference, San Francisco, by Gerald E. Arnold, Director, Water Dept., San Diego, Calif.

WATER utilities are business institutions and must operate on sound business principles in order to perform the function for which they are intended. A water utility has a commodity to sell and customers to buy it. The principles of economics, including the law of supply and demand, apply to water works as well as to any other business enterprise. Usually the water utility operates as a monopoly in the area it serves and is therefore relieved of the spirit of competition, which prevails in most business fields. It renders an essential service, however, and must operate to meet this requirement. In competition the price of the product is governed almost entirely by the law of supply and demand, taking into account the cost of production, distribution and selling. Because water is a necessary commodity for which there is always a market, its price cannot be made wholly contingent on supply and demand. Some judgment must therefore be exercised in determining the business principles by which the utility will be run, and these, in turn, determine the cost and the selling price of the water.

Some water utilities are privately owned and financed, but the great majority are municipally or publicly owned, and are chiefly concerned with giving service at the minimum cost to the owners, that is, the public. Private ownership of utilities allows the organizations to follow some practices which are not permitted those under municipal or public ownership. For example, a private utility can employ individuals, let contracts, purchase materials and supplies and carry on other operations without the necessity of complying with civil service rules or calling for bids. The operations of publicly owned utilities, however, are governed to some extent by these requirements.

Determining Water Rates

Formerly most water utilities were privately owned and set their own prices, which resulted in extended litigation. More recently state utility commissions, or similar organizations, have limited the prices utilities may charge for their services. In California there was a constant battle in the courts over rate cases until about 1912, when the Railroad Commission of California (now called the Public Utilities Commission) was organized and given the responsibility of regulating utility services. Since that time there have been few rate cases in that state.

The price the customer pays for water is in reality a service charge, since it must frankly be admitted that the actual water costs the utility operator nothing, whether that supply comes from a lake or a stream, is

pumped from underground, or is impounded runoff. The price at which the water is sold depends on the investment in the water plant and the cost of operating and maintaining it. In other words, a charge is made for the use of the pipes, pumping stations, treatment plants and other facilities which convey the water from its source to the customer. Obviously, the only fair way to charge for such service is on the basis of the amount of water used by the customer. Many utilities collect a flat rate from all except industrial and other large customers. Others are entirely metered. Except where water is extremely cheap and where plant investment and operating costs are comparatively small, metering is the only satisfactory method of dispensing water.

The quality of the water at the source must be taken into account in determining the price at which it is sold to the consumer. A comparatively pure water which needs very little treatment can obviously be sold for less than one requiring filtration or softening. Where softening is planned, the economics of the situation must be carefully considered, as softening improves the water only for the purpose of washing with soap. The advisability of softening an entire city supply at a high cost is doubtful, when only a very small percentage of the water is used with soap. Water for special industrial needs and boilers should be treated by the consumer.

Surplus for Plant Expansion

In some communities the surplus earnings of a municipally owned water utility are used to offset the cost of other municipal operations. This results in an excessive burden on the water user, since he pays a disproportionate share of the community expenditures. The policy also invariably results in a deficiency of funds within the water department for any needed plant expansion. With the growth of the community, it becomes necessary to vote bonds for the requisite additions to water facilities. Normal depreciation and replacement charges are sometimes not properly accumulated by the utility, because of this diversion of funds to general city operations. This is a matter of policy which each community will determine for itself, unless a state authority supervenes. The author believes it to be generally bad practice to divert water revenues elsewhere.

Attention must be given to the plant necessary for the production, distribution and sale of water. The source of supply is the first item to be considered. It should, of course, be the most readily available satisfactory source. Adequate facilities should be provided to meet anticipated needs, but should not be expanded beyond reasonable estimates at a high ultimate cost to the customer. Transmission, treatment and distribution should likewise be adequate and should keep pace with the growth of the community.

Operating Efficiency

The business office of the utility should be operated on sound economic principles to accomplish the desired results without unnecessary cost. During the war it was found advantageous in many communities to read meters and bill customers bimonthly. This appears to be a good plan for most communities to follow. For large customers, however, it is more desirable to read the meters and bill on a monthly basis. Billing should

be handled as rapidly as possible after the meters are read. Otherwise, the customers will receive their bills long after the service has been rendered, and any adjustment of claims for high charges will be difficult to settle.

In routing the meter-reading and bill-collecting work through the offices of the department it is necessary to establish a strict schedule, which must be adhered to regardless of holidays, vacations or other interruptions. In San Diego, the city is divided into areas and all meter routes in certain districts are covered within certain specified days each month. Work is done overtime and on Saturday if it is necessary to maintain the schedule. The billing also goes through the offices on a schedule and follows immediately after the meter reading.

An important factor in the efficient operation of the utility plant is a satisfactory corporation yard or shop headquarters. The yards and shops of many utilities have grown like Topsy without careful long-term planning and are often totally inadequate for proper or efficient service. Suggestions regarding the improvement of corporation yards and water works offices are contained in a previous JOURNAL article (1). Thought should be given to the installation of truck-level platforms and power-operated machinery for lifting and moving heavy loads. The utilization of such devices will soon repay their cost in labor saved and will result in better employee relations.

Personnel Problems

The selection of adequate and satisfactory personnel for utility operation is of paramount importance. Most municipally owned water utilities are governed by civil service regulations in the hiring of personnel, but the training and manner of employment of these men is largely within the discretion of the utility operator. Thorough training programs have been seriously neglected. The author feels that every water works employee, from the newest laborer to the top executive, should be familiar with the general over-all operations of the utility and its plant. Water is an item used by every resident of the community, and anyone who works for the utility, whether it is publicly or privately owned, is certain to be asked questions by his friends and acquaintances regarding the utility and its product. Several utilities have prepared a booklet of general information which is distributed to all employees and gives them the facts they should know. This will result in their answering questions accurately and disseminating correct information. As part of the training program, employees should be given an opportunity to visit the various sections of the water works so that they can actually see the reservoirs, pumping stations, treatment plant and other facilities in operation. The time and money spent in this portion of their training will be repaid many times. Competent supervision of personnel is necessary in every field, and supervisory employees should be trained in public relations and in the handling of personnel under their direction. Anyone obviously not suited to a supervisory position should be removed from office or given another assignment.

The appearance of the employees at their work is important. Putting meter readers in uniform has resulted in better relations with the public. These uniforms need not necessarily

be elaborate or expensive, but they should be neat and clean. The employees will take better care of their uniforms if they are required to purchase them themselves. Adequate work clothing should be provided for men whose duties require them to work in water or mud. Suitable raincoats and rain hats should be issued, as well as hip boots, for men whose duties necessitate their use. Proper uniforms should also be provided for employees in laboratories and water treatment plants. These parts of the operating utility exemplify the sanitary phase of the operation, and the employees should represent a compatible atmosphere. White laboratory coats on the workers add materially to the appearance of the laboratory and give the employees a professional air. For the filter or treatment plant operators, white coveralls have the same effect. It has been found desirable to require the employees to furnish their own uniforms, but the utility should pay the laundry charge. A laundry bill is a small item, but it assists materially in assuring that the employees will keep their uniforms clean.

Consideration should be given to retirement provisions for employees. Those utilities which do not already have a retirement system should immediately institute one. Employees working under a satisfactory retirement plan will be more efficient in their duties and more satisfied with their positions, and will therefore render better service to the utility.

Office Arrangements

The location and function of the water works office is important (1). The office should be located for the convenience of the public. Some water works offices are in the basements of city halls or in other dark and unattractive quarters. An office which has to do business with a great many residents of the community should be provided with satisfactory accommodations, and the old saying, "It is good enough for the water works," should no longer be tolerated. The offices should be well lighted and equipped with the necessary facilities for conducting business. Instead of having them work at a counter, some utilities have provided desks and chairs for those employees who take applications for service and conduct other business of that type with the public. This arrangement puts both the employee and the customer at ease and results in much better mutual understanding. Telephone company office arrangements can be studied to provide suggestions along this line.

Suitable pictures of the water works plant should be displayed in the office and changed from time to time to add a new note to the decoration. Water works structures are among the most beautiful, and pictures of them contribute substantially to the appearance of any office. The provision of a drinking fountain in the business office is a gesture overlooked by many utilities. In the author's travels around the country during the last few years, he has made it a point to see how many water works offices were equipped with a drinking fountain and has found that very few of them are. A fountain at a convenient location near the door is an attractive attribute of the water utility, which greatly advertises the product it has to sell. Placing cut flowers or growing plants in the office is another advantageous touch. Most utilities have flower gardens around pumping stations, reser-

voirs and other facilities. The delivery of a fresh bunch of flowers to the water works office every few days for display in a prominent position will not only add a touch of beauty but also help advertise the product, as water is required to grow flowers. The display of water works equipment or models of water works structures in the windows is worth while. These models should be changed from time to time, and it is recommended that one employee be assigned the duty of preparing and taking care of window displays. Scientific equipment from the laboratory, such as microscopes, test tubes and colored chemicals, makes an attractive layout. A cut-away section of a water meter, with some cards describing its operation, would be interesting. Models of dams and treatment plants, pictures of aqueducts and water supply sources, and other items of this type could readily be used for window displays. The merchant utilizes his windows to promote his business. Too many water utilities are ignoring an opportunity by letting valuable window space go to waste.

Public Relations

The subject of public relations is being adequately covered by the Public Relations Committee of the Association. This is one phase of water works operation which cannot be overemphasized, as it has been sadly neglected by the profession. "Silent service is not enough" makes a good slogan which should always be kept in mind by the water works operator. The occasional mailing of "bill stuffers" describing the water works is an excellent means of spreading information, together with appearances at civic meetings and school classes and publicity through the press and radio. The water works superintendent should not be modest about blowing his own horn, since too few people in the community know enough about the job he does. Publicity also helps to strengthen the superintendent's position in the community and gives him greater security. A water superintendent in one northwestern state has succeeded in withstanding the ravages of political change that has resulted in the replacement of nearly every other executive in the city government. Because he has let the residents of the community know the importance of his work and how well he is doing it, no city official dares to remove him from office.

Some thought should be given to the appearance of water works structures. Corporation yards and offices have already been mentioned. Pumping stations, reservoirs, treatment plants and other water facilities should be planted with lawns and gardens and given an occasional coat of paint to make them a credit to the utility.

The water utility should be raised to a high plane of respect in the minds of the residents of the community, but this regard can be obtained only by the efforts of the members of the water works profession themselves. It should always be kept in mind that the water utility is in business, that it has a product to sell and customers who must be satisfied. The application of sound business principles throughout the industry is of prime importance.

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Tests on Steel Pipes Lined in Place

By William G. Banks

A paper presented on July 24, 1947, at the Annual Conference, San Francisco, by William G. Banks, Div. Engr., Div. of Water, Newark, N.J.

THE pipelines (Fig. 1) which convey the water from Newark's Pequannock watershed to Cedar Grove, its main distributing reservoir, are parallel, riveted steel lines. The older is 48 in. in nominal diameter for its entire length and was put in service in 1892. The other, which was put in service in 1896, is 48 in. for the first 29,000 ft. and 42 in. thereafter. Both lines have single-riveted circumferential seams 6 ft. 10 in. apart and one double-riveted longitudinal seam. Courses of the No. 1 line are cylindrical, alternating in and out; those of the No. 2 line are tapered. These pipelines extend to Newark and, reduced to 36 in. in size, serve as two of the important distributing mains there.

Between 1933 and 1937 a 21,000-ft. section of the No. 2 Pequannock pipeline, 42 in. in size, was cleaned and lined in place with a coal-tar enamel.* This project was carried out as a Civil Works Administration and Works Progress Administration program (Section *A* of Fig. 1). In 1935 and early 1936 the first cement-mortar lining was placed in the No. 2 line from Macopin Intake at the head of the line and extending about 29,000 ft. toward the city (Section *B* of Fig. 1). This was the first large pipeline in the United States cleaned and lined in place by machine with a thin, nonreinforced cement-mortar lining (1). Many of the conclusions in this paper concerning the life expectancy and effectiveness of cement-mortar linings are based on an examination made of this section in 1947.

Since 1936, under six different contracts, the remaining 51,000 ft. of the No. 2 line to Great Notch, the 80,000 ft. of the No. 1 line from Macopin to Great Notch and a 13,000-ft. section of 36-in. cast-iron pipe in Newark have been reconditioned with cement-mortar lining. Three different methods have been used: (1) the "Perkins" machine developed by the T. A. Gillespie Co. and now owned by the Centriline Corp.; (2) hand-applied and hand-finished gunite; and (3) the "Crom" machine developed and used by the Preload Corp.

The benefits resulting from Newark's program of aqueduct reconditioning include the restoration and maintenance of carrying capacity, an extension of the life of the pipelines and a reduction in maintenance requirements.

Restoration of Capacity

The Pequannock pipelines were constructed under the direction of Clemens

*"Bitumastic" enamel, a product of the Wailes Dove-Hermiston Dept. of the Koppers Co., Inc.

Herschel, the eminent hydraulic engineer. To serve as a protective coating and lining, bituminous material was applied to the pipes by dipping the sections twice in "boiling asphalt" (*2*). Tests conducted in the No. 1 line when first installed indicate a Williams-Hazen value of *C* of about 105. By the time the No. 2 line had been installed the value of *C* in No. 1 had decreased to 96. In 1907 the relative values of *C* in the No. 1 and No. 2 lines were 82 and 90 respectively. Tests made by the Newark Division of Water from 1935 to 1945 showed that *C* was 70 for No. 1 and 80 for No. 2.

According to tests made after reconditioning, the lines have been restored to better than their original capacity. Friction coefficients of the various sections have repeatedly been between 125 and 135, based on the 42- and 48-in. nominal diameters of the lines. The profile of the line is such that, under certain conditions of flow, the hydraulic grade line is visible in a glass tube at ground elevation. It can therefore be observed with considerable accuracy. Tests of sections with linings of $\frac{3}{8}$-in., $\frac{5}{8}$-in. and 1-in. thickness indicate that the values of *C* based on nominal diameter are approximately the same, regardless of the thickness of the lining. It should be kept in mind that the lines are riveted steel, with circumferential joints 6 ft. 10 in. apart. Evidently the streamlining of flow brought about by the more complete submergence of joints under a thicker lining compensates for the reduction in area. It should also be pointed out that a number of factors exist which make a comparison of friction coefficients dif-

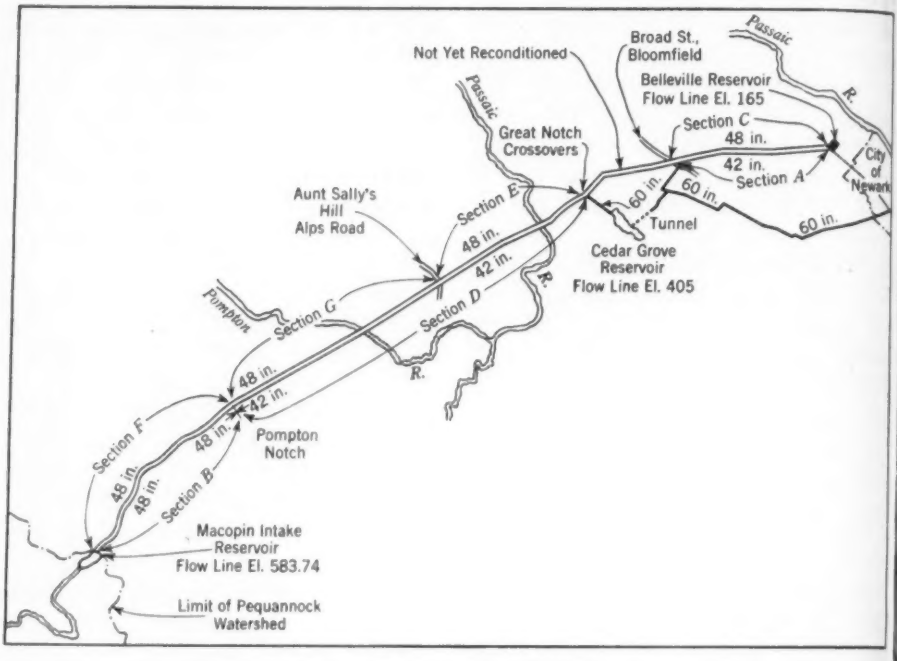

FIG. 1. Pequannock Pipelines

ficult. The lines contain many changes in alignment, horizontal as well as vertical; there are many air valves and blow-offs and a few line valves; two sections of each of the lines have been relaid in recent years across highways with abrupt changes in alignment, the pipe being lined with coal-tar enamel; and for one long stretch both lines are very close to the hydraulic grade line under maximum flow conditions. An attempt has been made, however, to evaluate these factors in compiling the data for Table 1.

Both Pequannock lines running from Macopin Intake to Great Notch and through the 60-in. line to Cedar Grove Reservoir can now, after being reconditioned with cement-mortar linings, deliver 80 mgd. into Cedar Grove Reservoir. Prior to reconditioning they were able to deliver only 46 mgd. If Cedar Grove Reservoir and the 60-in. line supplying it had been in existence when the Pequannock lines were first installed, 62 mgd. would probably have been the limit of delivery of the two lines into the reservoir. Taking 62 mgd. as 100 per cent, capacity had decreased to 74 per cent by 1935, just before reconditioning was begun. By 1947 capacity had risen to 129 per cent, an improvement of almost 75 per cent over the 1935 figure.

Sections with cement-mortar linings have shown no diminution in carrying capacity after several years' service. In fact, flow tests indicated a small increase in capacity when the line had been in use for two years. More recently, because of greater experience in making and interpreting tests of carrying capacity, it has been concluded that this increase may have been merely a variation of results within the limits of the accuracy of the observations.

TABLE 1

Williams-Hazen C *of Pequannock Pipeline Sections*

Section	Size *in.*	Length *ft.*	Type of Lining	Date Lining Placed	Williams-Hazen *C* Based on Nominal Diameter	
					Before	After
A	48	21,000	Coal-tar enamel ("Bitumastic")	1934–7	70	125–130
B	48	29,000	Cement (Perkins)	1935–6	80	125
C	42	21,000	Cement (Perkins)	1938	80	125–130
D	42	50,000	Cement (Perkins)	1942–3	80	135
E	48	21,500	Gunite (hand applied)	1945	70	135
F	48	29,000	Gunite (Crom)	1946	70	125
G	48	28,500	Gunite (Crom)	1946	70	130

The only indications of rust in the lines are at isolated points on the tops of rivet heads which are at the surface of the mortar lining. After a short period of service, a thin film of slippery organic material forms on the surface of the lining. Its effect on carrying capacity is not known.

Operating conditions have not afforded an opportunity to examine the coal-tar enamel lining of Section *A* of the reconditioned portion. Sections of the Pequannock pipelines which have been replaced in the course of state highway work had all been lined with coal-tar enamel, and examination of

them has shown that the bituminous lining is in excellent condition.

It is concluded from the Newark experience that the restored capacities in the Pequannock lines will be maintained throughout the remaining life of the steel in the lines.

Extension of Life

Thin cement-mortar linings in Newark riveted steel lines have now been in service for eleven years. Two examinations have been made of the oldest lining, which was placed by the Perkins machine. In both tests pieces of lining were cut out. In 1938, after two years of service, there was an indication of a change of some sort in the surface of the lining to a depth of approximately $\frac{1}{20}$ in. The surface of this modified portion of the lining, to a depth of approximately $\frac{1}{50}$ in., was of a still different appearance. Analyses of samples showed that the lime content of the modified portion had been reduced from its original 26 to 5 per cent and that iron and aluminum oxide totalled 11 instead of the original 4.3 per cent.

Elaborate tests of lining samples made in 1947 show that the surface change observed earlier has extended to a depth of about $\frac{1}{8}$ in. The changed material is not so hard as that underlying it, though it is by no means soft. A sound film of the procedure of cutting the various 10 × 10-in. samples of lining from the pipe would be sufficient to convince any doubter that the cement-mortar lining will continue to afford protection to the steel surfaces beneath for many years to come. The majority of the samples came off in one piece after three sides had been cut through to the steel, the steel struck hard many times to loosen the lining, and the sample finally cracked along the fourth side by up to twenty blows of a 6-lb. calking hammer against a sharp cutting chisel.

The section recently examined extends from Macopin Intake at the head of the pipeline for a distance of about 29,000 ft. towards the city. Since it was lined it has always conveyed chlorinated water and often ammoniated water. Points of application of the ammonia and chlorine are about 300 ft. from the head of the line. Samples of the lining were taken at four points: (1) at the head of the line before the water had been treated; (2) about 7 ft. beyond the point of chlorine application, where its effect would be at a maximum; (3) about 9,000 ft. from the head of the line; and (4) near the end of the 29,000-ft. section of eleven-year-old lining.

Surprisingly, all four samples adhered to the pipe strongly and one was broken into three pieces while being pried loose from the steel. As tests of new linings had not always shown strong adherence, the mention of this quality was carefully avoided in the specifications. Even in the latest specifications the lining is only required "to hold itself firmly against the pipe surface." It may be that adherence develops in time, when the line is in service and under pressure.

The No. 2 cement-lined pipe, for almost the entire length of the 29,000-ft. section recently examined, is coated with a slimy layer of amorphous black organic matter which washes off very easily. Under it and rather securely attached to the surface of the lining, is a black coating which looks as if the pipe had been dipped in coal tar or asphalt. This coating completely covers the surface, has no appreciable thickness and does not wash off easily. Its analysis is given in Table 2. The

existence of the coating indicates that there has been no general wearing away of the cement-mortar lining.

The only surface evidence of wear or deterioration is a fan-shaped area which extends downstream from the chlorine-injection pipe for about 50 ft. to a point where it covers the lower quarter of the 48-in. pipe. In this sector both the slimy coating and the black asphalt-like material are absent. In the sample of lining cut 7 ft. below the chlorine pipe, the fan-shaped area is about 1 ft. wide. At this point the surface is sandy in texture, reddish in color and shows signs of wear for a depth of perhaps 0.01 in.

From an examination of the cross-sections of the various samples of lining, it is concluded that the stratum of change in the portion of the cement-mortar lining in contact with the water occurs throughout the pipe—above the point of application of chlorine as well as below—and to approximately the same depth of $\frac{1}{8}$ in., regardless of the location and thickness of the lining. Analyses confirm the earlier indications that the change is a loss of lime, possibly with a gain in iron and aluminum. In the change, the silica becomes a larger percentage of the whole. Table 2 compares a typical chemical analysis of the asphalt-like surface coating and of the changed surface material with the apparently unchanged cement-mortar beneath.

The stratum of changed material is not as hard as the underlying mortar. This was determined from grinding tests made on samples of the lining from each of the four sampling locations. In two minutes of grinding with a carborundum wheel, during which $1\frac{1}{2}$ to 2 sq.in. of surface was in contact with the wheel under conditions as nearly identical as possible, representative samples of the changed lining lost 0.2 g. of material, while the unchanged portion of the lining lost only 0.1 g.

It should not be assumed from this evidence that the lining is suffering serious deterioration. Only in the fan-shaped area within 25 ft. of the chlorine pipe is there any indication of wear on the lining. The sample taken from the area about 7 ft. below the chlorine pipe showed a loss of 0.5 g. in the two-minute grinding test.

Newark's cement-mortar lining specifications require a lining that is uni-

TABLE 2

Typical Chemical Analysis of Samples of 11-Year-Old Lining

Description of Sample	Moisture	Loss on Ignition	Fe_2O_3	Al_2O_3	CaO	SiO_2
	per cent					
Black asphalt-like coating on surface of cement-mortar lining		64.2	1.74	13.74	5.92	10.76
Stratum of changed material in contact with water (black asphalt-like coating excluded)	4.29	11.08	1.47	4.75	8.26	50.84
Unchanged cement-mortar lining beneath stratum of change	4.10	10.3	1.39	4.35	25.14	40.56

form in thickness (not less than $\frac{3}{8}$ in. nor more than $\frac{7}{16}$ in.), contains no sand pockets or defects, covers rivet heads, has a smooth, trowelled finish and a tensile strength of not less than 300 psi. after seven days and not less than 500 psi. after 28 days.

Because of this last requirement, many tests have been made of the various cement mortars used in the Newark lines. Tensile strength has been

TABLE 3

Tensile Strength of Lining Samples

Location	Sample No.	Thickness *in.*	Tensile Strength *psi.*
No. 1	1a	0.41	528
	1b		
	1c		
No. 2	2a	0.383	513
	2b	0.356	560
	2c	0.360	524
	2a*	0.288	681
	2b*	0.286	690
	2c*	0.288	655
No. 3	3a	0.47	552
	3b	0.47	532
	3c	0.47	655
No. 4	4a	0.445	562
	4b	0.442	544
	4c	0.443	565

* From stratum of unchanged material.

accepted as a simple standard of comparison, since there is in general a relation between tensile strength and density, imperviousness and other desirable characteristics of a mortar. Test pieces of the outline of standard briquettes were cut, with a thickness equal to the thickness of the lining. The tensile strength of an experimental lining—cement and sand, 1 : 1, at summer temperatures—placed with the Perkins machine was 395–600 psi. at seven days, averaging 513 psi. for six briquettes; the 28-day tensile strength was 434–707, averaging 600 psi. for eight briquettes. Hand-placed and hand-finished gunite—cement and damp sand, 1 : 3 (dry mix, 1 : 2.1), at spring and summer temperatures—showed a tensile strength at seven days of 300–446 psi., averaging 330 psi. for 50 briquettes; the 28-day test showed 500–631 psi., with an average of 530 psi. for 50 briquettes. The tensile strength of an experimental lining—cement, sand and asbestos, 1 : 1.25 : 0.25—placed with the Crom machine was 468 psi. at seven days and 620 psi. at 28 days. Using the same machine, but

TABLE 4

Absorption by Lining Samples

Sample From Location No.	Per Cent Absorption by Weight
1	4.56
2	9.89
3	5.78
4	7.25

with a 1 : 1.25 mixture of cement and sand and no asbestos, the seven-day finding was 510 psi. and the 28-day value 650 psi. The Crom machine, with a 1 : 2 mixture of cement and sand plus 5 lb. of asbestos fibre to each bag of cement at summer temperatures, gave a seven-day result of 316–381 psi. and an average of 350 psi. for ten briquettes; the 28-day tensile strength was 470–600 psi., averaging 540 psi. for 28 briquettes. An identical mixture placed with the Crom machine at winter temperatures showed a seven-day strength of 270–500 psi., with an average of 350 psi. for 33 briquettes; the 28-day tensile strength was 404–696 psi., averaging 560 psi. for 37 briquettes.

Similar strength tests were made of test pieces cut from each of the four samples of lining after eleven years in service. The test pieces were as thick as the lining, including both the changed and the seemingly unchanged strata. An attempt was made on some of the test pieces to grind off the softer surface material so that the strength of the rest of the material could be determined. This was successful only with samples from the chlorine-affected area (Location No. 2). The results of these tests are shown in Table 3.

Absorption tests (Table 4) were made of the various samples by first drying them at 110°F. for 48 hours, weighing them, boiling for one hour, cooling for 1 hour and again weighing them.

From the observations made it seems reasonable to expect that the cement-mortar lining in the Newark steel pipelines will last indefinitely, just as it has in cast-iron pipes in many systems carrying water similar to that of Pequannock.

For the most part, nothing was done to the exterior of the lines in this process of reconditioning. When uncovered to provide entrance into the pipe, the exterior of the line was found generally in good condition. Outside and inside pittings extend to a depth of $\frac{1}{8}$ in., so that wherever they coincide, perforation of the $\frac{1}{4}$-in. pipe walls occurs and leaks develop. Between the completion of the cleaning of those sections being reconditioned and the placing of the lining, careful examinations were made for perforations. Deep pittings were filled with weld metal. Near-perforations were punched through, and all holes were either tapped and plugged or closed by welding. Most were plugged with $\frac{1}{2}$-in. or $\frac{3}{4}$-in. screw-plugs. One 6-in. patch and four 3-in. patches were welded to the pipe to cover large holes or areas with several small holes close together. In the 160,000 ft. of pipes lined with cement mortar between Macopin and Great Notch about 650 holes were plugged, 50 were closed by welding and 200 pit holes were filled with weld metal. Although it was originally expected that perhaps 20,000 ft. of each line would have to be replaced where it runs through swamps and corrosive ground, no replacements were found necessary. In none of the locations of maximum pitting was there evidence of as much as 5 per cent loss of strength by reason of pitting.

Exterior corrosion would seem to be the factor which will determine the duration of the remaining life of these aqueducts. Since in over 50 years exterior corrosion has penetrated to a depth of about one-half the thickness of the steel pipe walls, it might be predicted that the reconditioned lines will have at least another 50-year period of usefulness.

Reduction in Maintenance

No leaks have developed in any portion of the pipeline which has been lined with cement mortar, except those occasioned by the restoration of service through the lines. Several such leaks occurred at welds that replaced sections cut from the steel for entrance into the pipe.

Although the various sections of the pipelines were out of service during reconditioning, all air, blow-off and line valves were put in good operating condition. Most of these are the valves originally installed when the lines were constructed more than half a century ago.

As a result of the reconditioning, the maintenance work on the Pequannock

lines has been very considerably reduced. Leaks are now a rarity and are found principally within the city limits in 36-in. steel lines of about the same age as the 48- and 42-in. Pequannock lines. These 36-in. lines are on the program for reconditioning shortly.

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Discussion

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The practice of lining steel pipelines in place is relatively new. For this reason, the account of Newark's experiences with cement-mortar lining in 1935–36 is of great interest and value to those contemplating the rehabilitation of lines under their supervision. The author is to be commended for an excellent and timely contribution to this important phase of maintenance engineering.

Under Mr. Banks' technical supervision, Newark pioneered on a large scale in the rehabilitation of steel pipelines in place. Following the example of Newark and of Toledo, Ohio, in 1939–40 Akron cleaned and lined approximately 20,000 ft. of 36-in. lock-bar pipe which had been laid in 1913–14 and 14,000 ft. of 48-in. lock-bar pipe laid in 1921 (1, 2). Akron's experience with this initial lining was so satisfactory that after V-J Day a contract was signed with the Lock Joint Pipe Co. for the cleaning and lining of an additional 36,000 ft. of 36-in. and 36,000 ft. of 48-in. steel pipeline, which represented the remainder of the lines originally laid in 1913 and 1921. Unlike the previous lining, which was completed under a tripartite arrangement involving active participation by the Works Progress Administration, the city of Akron and the Centriline Corp., all of the work on the second contract, including repairs and excavation, was done by the contractors under plans and specifications prepared by the Akron Bureau of Water and Sewerage. The incorporation of the items of repair and excavation into the contract was decided after discussion with prospective bidders. The adoption of a fixed price of $3.50 per cubic yard for excavation, $5.50 per hour for welding and $0.15 per pound for plate used for repairs effectively prevented unbalanced bidding and the possible award of a contract unduly influenced by relatively minor items. The sections of the specifications covering this matter may be found in the appendix to this discussion.

The 1946 work involved the two parallel steel lines which constitute the only supply from the treatment and pumping works to the city. Because the contract was executed during a period of relatively high pumpage, close co-ordination between the contractor and the water works was necessary to insure a continuous, adequate supply of water from the pumping station without placing an excessive head on the pumps and on the mains themselves. No unusual features were presented by the cleaning and lining contract of 1946. At a river crossing, pipe with grades of 20 and 29 per cent were successfully lined using a cable

and winch to control the lining machine.

Prior to the 1946 work, an inspection of the two end sections of the 1940 lining was made. No deteriorating changes were observed except for a slight discoloration and the presence of a film on the lining.

It is believed that a uniform lining $\frac{3}{8}$ in. thick is almost always the most desirable and is perfectly satisfactory for effective rehabilitation. Any attempt to vary the thickness during the lining process in order to compensate for different conditions in the old pipe results in operating difficulties. The need for welding all pits in advance of lining is questionable.

It is recalled that after cold weather set in, following the completion of the 1940 work, leaks developed. These were confined entirely to the welded joints used in replacing the sections of pipe cut out where inlet manholes were not available to permit the introduction of the lining materials. The leaks were readily repaired by welding strips over the original butt-welded joint, and no others have developed since 1940. That joint failures did not occur in the 1946 work was due to improved welding techniques, both in the process itself and in the selection of the type of rod.

One major reason for the use of lining in place was to prolong the life of a pipeline which had become pitted and had sprung numerous leaks. With this purpose in view, tests were made to determine the tensile strength of the mortar in spanning openings. Conditions approximating those found in badly pitted and leaking pipe were simulated in tests on $\frac{1}{4}$-in. lining which spanned holes up to $1\frac{1}{4}$ in. in diameter. No leakage resulted under 200 psi. pressure. It is considered that the tensile strength of the mortar employed has an important bearing on the value of the lining when applied to the reconditioning of old—and possibly leaky—pipelines.

Akron's experience when cutting an inlet manhole and making a large size tap indicates that the mortar adhered firmly to the steel pipe. As at Newark, heavy blows with sledge hammers were necessary to break away the lining.

The fact that the two mains at Akron are parallel and only 30 ft. apart afforded a unique method for determining the value of the Hazen-Williams C on the newly lined main. The two mains are divided into sections separated by line valves and a 24-in. valved cross-over at each end of a section. A 7,700-ft. section of 48-in. main was selected for testing the flow characteristics. The parallel section of the 36-in. main was shut off, forcing all the water through the 48-in. main. Tests were made to insure that both line valves and both cross-over valves did not leak. The cross-over valve at one end was then opened. One leg of a manometer U-tube was connected to the 36-in. main at the closed cross-over, and the other leg was connected directly opposite it, on the 48-in. line. This made the 36-in. main the 7,700-ft. leg of a U-tube to measure the friction in the 7,700 ft. of 48-in. main between the opened cross-over and the manometer at the end of the section. Using the full 48-in. diameter, a Williams-Hazen value of C of 116 was obtained. With a 47-in. diameter, a C of 123 was observed.

It is gratifying to learn that the experiences at Akron corroborate the findings at Newark. The lining of steel, and other, mains in place is becoming a valuable aid in rehabilitation work. Since thousands of miles of

mains 16 in. or larger and of ages up to 100 years or more form part of this country's distribution and supply systems, engineers charged with their care will do well to investigate the possibilities offered by lining in place.

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APPENDIX

Extracts From Cement-Mortar Lining Specifications of the Akron Bureau of Water and Sewerage

Measurement and Payment. The quantity of cement-mortar lining to be paid for shall be the actual number of linear feet of pipe cleaned and lined with cement-mortar lining as specified.

The price paid shall include the furnishing of all materials, equipment and labor necessary to clean the pipes and complete the lining as specified. It shall include the protection of pipeline appurtenances exposed in the waterway of the pipe, the cutting of all other openings in the pipe, the insertion of the lining machines and other equipment into the pipelines and the removal thereof, the closing of openings cut in the pipe by welding and the furnishing of all materials for this purpose, the curing and protection of the lining, and the guaranteeing of materials and workmanship in connection with the lining for a period of two years from the date of acceptance of the work.

No extra payment will be made for excavation, removal of excavated material, shoring, sheeting, pumping, backfill or other appurtenant operations, except as provided for below.

An additional sum will be paid, as stipulated in the proposal, for lining thicker than $\frac{3}{8}$ in., when ordered.

Payment for Repairs. This will include all excavation and backfilling, welding, and furnishing of steel plates necessary to make such repairs to the pipe as the Engineer may order. The method employed and materials used shall be approved by the Engineer.

Excavation, welding and steel plates necessary to provide entrance of equipment and materials, and the closing of such entrances, will not be included for payment under this section.

Payment for excavation will be at the rate of $3.50 per cubic yard for the actual number of cubic yards excavated within the lines and grades ordered by the Engineer and will include the whole cost of excavating, bracing, pumping and backfilling necessary for the excavation ordered.

Payment for welding will be at the rate of $5.50 per hour for the actual number of hours required to perform the work ordered. The price will include the whole cost of the operation, comprising the furnishing of all labor, material and equipment for cutting and welding in making the repairs to the pipe as ordered.

Payment for furnishing steel plate will be at the rate of $0.15 per pound for the actual number of pounds of steel plate delivered to the job and incorporated in the repairs ordered.

Equipment and Procedure for Long Line Hydraulic Studies

By Fred C. Scobey

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SINCE 1914 the author has planned equipment and procedure and conducted capacity tests on more than 100 pipes made of wood staves, concrete and metal. The results of this work have been published in several bulletins of the U.S. Dept. of Agriculture, under whose auspices the research was accomplished. Detailed descriptions of most of the tests are found in these publications (1–3).

The object of the research was to obtain more complete data and develop better hydraulic formulas for the use of irrigation engineers. Of course, water obeys the same physical laws whether it is used for irrigation, hydroelectric power or a municipal supply, although its physical characteristics may vary in each of these services. These differences are fairly well known and may be provided for.

Hydraulic studies of long pipelines are useful for several reasons. They make possible the development of basic formulas and provide data for the future design and operation of similar lines. They also determine changes in the capacity of a line. When a line is new, the coefficients for any of the popular formulas can be established for given reaches of the line. Repeat tests on the identical reaches help locate those needing attention and reveal any deterioration—or, occasionally, slight increases—in capacity. An extended series of tests at "industrial velocities"—those within the range of usual operation procedure—can be used to obtain the specific law of flow for a particular stretch of pipe. This law will include the over-all losses within a given length of pipe. Lowering the velocities still further should produce the dips and bends in the curve on logarithmic paper which are called for in research on fluid mechanics. Such information will probably have a marked influence on pipeline design in the future, but at present it is seldom used in water works practice.

Essential Field Data

For consideration in any formula, whether standard or novel, the essential field data are the same: the mean velocity of the water, V, in feet per second; the total loss of head due to friction, h_f, in feet; the length of pipe between gage locations, L, in feet; and the diameter of the pipe, d, in inches, or D, in feet. The temperature of the air and water and the pH values should also be secured.

The velocity, V, can often be determined directly by timing the flow of a batch of color, salt solution, confetti, bran, or other indicator. Generally V

is determined indirectly by measuring the quantity of flow, Q, in million gallons per day or in cubic feet per second, by a Venturi or other meter, or by a weir, orifice, pitot tube or similar device. V is then obtained by dividing Q, in cubic feet per second, by the area of the pipe interior, A, in square feet.

The loss of head-of-elevation, h_f, in the energy gradient of a measured length, L, of pipe between pressure gages (piezometers) is easily computed. If the diameter of the pipe is the same at both ends of the reach, the energy gradient is equal and parallel to the well-known hydraulic gradient. It is highly undesirable to have two sizes of pipe in the reach, but if there should be a difference in pipe sizes, the corresponding difference in velocities must be considered. To the elevation on the hydraulic gradient at Gage 1 the velocity head at that point is added to give the elevation of point 1 on the energy gradient. The elevation of the energy gradient at Gage 2 can be obtained in the same way. The difference (always a drop) is the total loss and is equal to the friction loss, if there are no corrections for "specials."

The net length of reach, L, between gages is the true "developed" length, rather than the difference between station numbers on the profile. In rugged terrain, such as that on the line of the new San Diego Aqueduct, the many deep gulches make the developed length considerably more than the profile length. Another prime example is a portion of a 7-mile length of 26- and 30-in. pipe in the Marin (Calif.) Municipal Water Dist., which is shown in Fig. 1. The true length of a line should be chained in the field or based on the lengths of pipe paid for under a contract in which the measured length of the finished pipe is stipulated.

FIG. 1. "The Crookedest Trunk Line in America"

If a line may be dewatered, two or more diameters can be measured at many locations within the line to find the true size of D, the pipe interior. For rough conduits such as rock-cut tunnels, a sort of pantagraph device has been developed to draw to scale the actual configuration of the section by tracing the perimeter with a small wheel on the end of the long arm of the instrument. Often pipe units left over from construction can be located and measured. This is especially true of concrete lines. Acceptance of such measurements assumes that the interior of the pipe has not changed while in use. Such an assumption should be verified through manholes or other points of access to the interior of the line. When new, a metal pipe can be measured by determining the outside circumference in many places and deducting from the computed outside diameter twice the thickness of the plate. The author has employed the method of sounding across the pipe at the quarter points through small holes drilled for piezometers (see page 1197). Concrete pipes of the best type are made almost to precision measurements. Individual diameters vary but little from the theoretical, and the average diameter for many sections of pipe must be computed to several significant figures to determine any variation from the nominal size. In small "line pipe" there are large discrepancies between nominal and actual sizes. Not until 2-in. size is reached do the two reasonably conform. Up to 12-in. size, the actual diameter is more than the nominal, and above 12 in. the reverse is true. In metal pipe these differences between nominal and actual inside diameters become very important, and therefore true sizes must always be determined.

Although many researchers compute friction coefficients for both nominal and actual diameters, the actual diameter computations are the only ones that truly apply to standard formulas. We often read that some pipe with an initial value for C of 130 has so far deteriorated that C is as low as 90. Such a statement should include the basis for the figure representing the size and, hence, for the computed velocity. If the pipe interior is badly throttled by lime or other accretions, the actual velocity will be more than that computed from the nominal size of the pipe, making the actual value of C not 90 but, say, 110, when computed on the true diameter. In this way, many fictitious values of C have crept into hydraulic data through the use of incorrect dimensions for some of the elements.

For metal pipes of similar interior but different diameter, relative capacities may be determined by using the graph shown in Fig. 2. The broken line, for instance, demonstrates that a 48-in. pipe will carry approximately 2.1 times as much, and a 72-in. pipe about 6 times as much, as a 36-in. pipe.

Planning Equipment and Procedure

Taking into account the elements to be determined in the field tests, plans may be developed from a study of the profile of the pipeline, a trip over the ground and conversations with the operators of the line, preferably after the trip.

1. *Hydraulic Gradient.* It must first be decided where satisfactory tests can be made to determine the hydraulic gradient. The profile should be examined and all breaks in the gradient located, especially those at main summits where the pipe may no longer be under pressure except at maximum

flow. For all flows less than the maximum, such summits become "controls," and the flow over the crest is said to be at "critical depth." The water then races down an open pipe at a velocity faster than the "critical," and finally fills the line at a "hydraulic jump." This jump will be located at a higher elevation than the next major summit where pressure is completely relieved.

Other breaks in the gradient may occur at aeration chambers, booster pumps, tunnels, diversions of water through secondary lines and so on. A valve set across the main line becomes a break in gradient unless it is wide open. Many specials form breaks, but some merely deflect the gradient downward or upward. If other research work has developed coefficients of loss, usually in terms of the velocity head

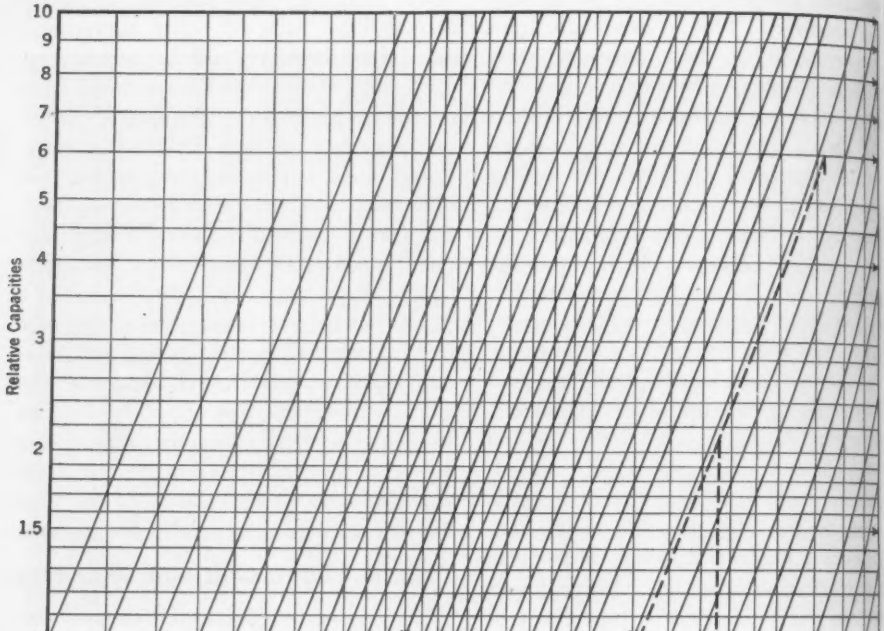

FIG. 2. Relative Capacities of Metal Pipe of Similar Interior

A control summit may be taken as the lower end of a reach to be tested for all flows from zero to maximum. It is also useful, however, as the upper end of another reach, if submerged at maximum flow. When submerged, of course, it is no longer a control. These summits cannot be employed as upper gage points for flows materially less than the maximum.

of the fastest velocity in the special. the gradient of a reach under test which includes such specials may be properly adjusted. Too many adjustments for too many specials, however, render questionable the results desired of the tests—the friction losses in the reaches of main trunk lines. If the tests are for the benefit of the operations department, it is proper to in-

clude all specials under operative adjustments. Tests without proper description and qualification should not be offered in technical literature as data suitable for the determination of friction losses in the particular size and type of pipe predominant in the line.

A series of tests from zero to maximum flow can be made only between breaks in the gradient, usually with some sacrifice in length of pipe at both ends of the reach. Some researchers believe that only straight reaches of pipe should be chosen. The author prefers to use a long, straight reach, where possible, as a basic criterion and test reaches with more curvature in order to get a differential value in the coefficients. This differential can be ascribed wholly to curvature influence only when the pipe is new, because nearly all increase in retardation is greatest toward the head end and diminishes materially a mile or two down the line. The differential in friction coefficients may turn out to be greater in a straight reach near the head end than in one with considerable curvature located some distance down the line. Since nearly all trunk lines have some degree of curvature, it is believed fair to include moderate curves.

If there are several sizes, and perhaps several types, of pipe available, often tests of a long portion with three or more gages will clearly define reaches of pipe of quite different characteristics.

When all reaches of pipe available for test are defined by the breaks in gradient as marked on the profile, the choice of test lengths becomes largely a matter of time, money and personnel. Very long lines may be divided into two or more groups, with field headquarters for the test parties changed once or twice to shorten the drive to and from work. The final choice of the exact test lengths depends greatly upon the type of pipe connections. Wood-stave, cement-asbestos and metal pipes may be tapped for piezometer gages almost anywhere without turning out the water, so that reaches are easily chosen. Corporation cocks set in the line at the time of construction form ideal gage locations. Concrete pipes are difficult to tap as the concrete tends to spall off on the inside, usually requiring dewatering to make repairs. For long reaches, suitable connections can usually be made at air valves, although they would be entirely useless as piezometer connections in very short lengths. Most air valves are provided with one or more cast-iron plugs that can be removed to allow plumbing fixtures to be inserted. Because both ends of the reach are under the same dynamic conditions, questionable elements in such connections are removed. If the valve is tripped by hand, any accumulated air is released, and small bubbles rising during the tests gather in the valve body above the inlet to the gage.

2. *Velocity.* Having chosen the specific reaches to be tested, the best way to find the velocity of water within the reach under observation must be determined. The lack of a suitable measurement of velocity, V, or of the quantity of flow, Q, may further reduce the reaches of pipe that can be tested. If a Venturi meter is available, it should be checked at a point close enough to the test reaches so that significant losses of water will not intervene. The same problem applies to any other method of measuring Q. If there are places where the water in the line is exposed to view, V may be determined by a coloring agent in-

jected under pressure at any convenient location upstream from the viewpoint, the more distant the better. There has been developed a device that "views" a small withdrawal of colored water by means of a photoelectric cell, indicating the intensity of color by the deflection of a needle.

3. *Number of Tests.* It should next be decided whether to make a single test, several of them (which would be preferable) or even an elaborate series. If a series is chosen, data should be recorded for viscous and full turbulent flow, with the transition zone well developed, in order to contribute the information needed for complete fluid mechanics research. If interest lies only in the operative hydraulics of the pipeline, a series of perhaps four observations may be made over the zone of turbulent flow available, especially up to the maximum flow possible under existing conditions. If only one set of observations can be made, they should be at the maximum velocities possible. One test, with readings at 5-minute intervals for an hour, is far better than a dozen runs with a short time between flow changes.

4. *Type of Gage.* The author has confined his gages largely to the mercury column type. The **U**-tube column requires a minimum of mercury and gives equal readings in identical glass tubes. The pot-and-column type has never been used by the author, because it offers opportunities for expensive accidents and its results do not appear to be nearly so definite as those of the **U**-tube column.

Flexible connections enable the lower and upper gage glasses to be plumbed and the true vertical elevations of gage zeros determined. At first, years ago, rigid connections were used, but great temperature changes between day and night resulted in much broken gage glass. The glass the author has been using is engine divided, with short lines etched for each hundredth of a foot, longer, numbered lines for each tenth, and half circles for each half foot. The glass comes in 20-in. lengths, with a true 18-in. length graduated. The etched lines are filled with red pigment and can be read directly with an engineer's level, thus carrying the gage zeros into the scheme of levels.

The assumption of long lines precludes the use of a differential manometer if the pressures from two ends of a reach are brought to a common point and the differential head, indicative of the total loss between gages, is determined. Although water columns appear ideal, slight changes in head require so much length of vertical gage that the additional time and equipment necessary for a mercury column, about one-fourteenth as high, are well worth while. Other fluids may also be used. Bromine (sp.gr. 3.2) and carbon tetrachloride (sp.gr. 1.6) allow columns somewhat shorter than a gage of water. The author has not used bromine but has found carbon tetrachloride unsatisfactory. It is hard to clean from the gage glasses and appears to break down until its accuracy is doubtful.

The ordinary Bourdon type of dial gage has never been employed by the author. The readings are always questionable in a zone where they are easily made certain with the mercury column. Even when recently checked, the Bourdon gage can only be read to a fraction of a pound, and 0.5 psi. represents a head of more than 1 ft. of water. In large pipes and over the usual length of reach, a questionable foot of water head may be a sizable part of the total loss. This is not ob-

jectionable if the total loss of head involved is at least 100 ft. of water, but such gages ought not to be used if a mercury column is feasible.

A thermometer should be used in conjunction with every mercury gage to find the proper specific gravity of the mercury for each reading. By the same reasoning, the temperature of the water in the U-tube must also be taken into consideration.

5. *Levels.* The only item left to plan is the difference in elevation of the gage zeros at both ends of a reach. As a rule, well-checked bench marks have been located throughout a main trunk line—usually with the elevation inscribed to the nearest 0.01 ft. Since the ends of all reaches to be tested are known, notes are prepared for the field recording the nearest bench marks to each gage location and their elevations. Provision is also made for a level, a rod and an instrument man.

6. *Piezometer Connections.* In tests of very long reaches of pipe, almost any type of connection is acceptable. For large pipes of inadequate length, the author has often used three or four connections at each end of the reach. A tap on the top of a pipe is subject to air bubbles flowing along the pipe with the water. Regarding the shell of the pipe as a watch dial, taps at three and nine o'clock are better, and at four "quarter points" still better. For wood-stave, iron or steel and cement-asbestos pipes, an excellent connection can easily be made. Piezometer tubes are prepared by sealing over the open ends of $\frac{1}{4}$-in. o.d. brass tubing approximately 14 in. long. About 1 and 2 in. from the sealed end on the same longitudinal element, both sides of the tube are pierced with a $\frac{1}{16}$-in. drill, making four piezometer holes for each brass tube. The other end of the tube is bent to form an L, with the drilled holes transverse to the bend. The diameter of the last 4 in. of the tube, including the holes, is then reduced with a file, and the water main is drilled through with a $\frac{1}{4}$-in. drill. Without turning off or dewatering the line, the sealed end of the tube can be slipped into the pipe with the leg of the L pointing up or down stream. The sealed tube extends some inches out in the water prism, with the small orifices transverse to the current. This does not mean that no velocity head impinges on the orifices, but that two piezometer tubes, identical in construction and in setting, and defining the two ends of a long reach of water pipe, are under the same dynamic conditions. If two or three of these tubes are set at one end of the reach and pressure tubing is brought from the L end of the tubes to a manifold—with a single tube from the manifold to the gage—an excellent piezometer has been developed. A refinement of these piezometer tubes is described by Wyckoff (4).

7. *Personnel.* A field party experienced in such tests can be held to a supervisor and two men for each pair of gages. The men act as gage readers, and, if necessary, one of them can read a near-by water meter, while the other observes and times the appearance of color, either in open water or by means of a photoelectric cell. The supervisor should be free to travel and observe the readings of all gages and Venturi or other meters. He can also read, record and initial all gage readings due at the time he passes, as a check against the readings of the man posted at that gage. When the tests include several near-by reaches of the same or different sizes and types of pipe, manpower can be saved if all

hands work on one reach and then go to the second while the flow is held constant in the pipe.

8. *The Schedule.* There is usually a great desire on the part of all concerned to get a large number of runs at various flows. On long lines with numerous breaks in the gradient, it takes hours for the flow to become fairly steady after a change. Sometimes no more than one good run can be handled in a day. A preliminary run can occasionally be scheduled for the day the gages are installed, using a flow that has been running at least overnight. During tests all inflow and outflow within the reach, L, must be eliminated. The first accepted run can usually be made the day after the gages are set up and tested. It may be necessary to remove the mercury column to a place of safety overnight in order to avoid breakage by freezing, during the spring and fall, or by small boys, for whom mercury has a great fascination. For these reasons, the schedule should not be set too early in the morning. Whenever records of many runs show great variation in the computed coefficients, it will generally be found that at least several runs were made within a short time of each other, perhaps all on the same day. If the flow for the first run has been undisturbed for hours, it is the best record of the series and usually the only record that can be trusted. An average of widely varying coefficients is of small value. One good run is better than many that do not allow adequate time for an approximately steady flow to become established. If the reaches are not too far from a change of supply, readings may be taken early in the morning; the flow can then be changed, and at least one more set of readings can be taken the last thing in the evening. Then the flow is changed once more and allowed to become steady overnight. Still shorter reaches near breaks in gradient permit a further set of readings at noon. Between readings the party can tie gages to checked bench marks, make computations, assemble gages of proper length for other test locations and complete its notes.

Gage Operation

Knowing the general range of pressure heads to be encountered at each gage location, the various mercury columns are assembled—usually in the shop—each with enough glass units so that all probable gage readings may be viewed in graduated glass. The glass units are joined by short lengths of pressure tubing. A tourniquet or two of stove wire make all glass and rubber tubing water- and mercury-tight. Iron pipe units of various lengths are used for the blind parts of the gage and for the **U**-tube at the bottom. Rigid screw connections are attractive but troublesome. Double-strength $\frac{1}{8}$-in. pipe, which offers economies in mercury, is preferable to standard. This may appear to be very small pipe, but $\frac{1}{8}$-in. line or standard pipe actually has an inside diameter of 0.269 in., or more than $\frac{1}{4}$ in. Double-strength pipe, although also of nominal $\frac{1}{8}$-in. size, has the same outside diameter—0.405 in.—but an inside diameter of only 0.215 in.

Units of this pipe can be smoothed to take $\frac{3}{8}$-in. pressure tubing. A bit of ordinary tan shoe polish smeared on the gage glass and the iron pipe makes a satisfactory lubricant. The volatiles in the shoe polish evaporate leaving clean wax to form a close bond under several tourniquets of wire while allowing the gage to be taken apart

easily. When assembled the gage can be fastened to a 1 × 4-in. surfaced board. Again wire tourniquets are suitable, holding the gages snugly at several locations, especially up near the valve assembly. With a draftsman's triangle, horizontal lines are drawn on the board under the gage zeros of each glass unit. The distance between gage zeros for glasses A and B, B and C and so on, is carefully measured, checked and lettered on the board. The elevations of the various zeros are easily computed from any point on the board located in the scheme of levels by sighting from a known height of instrument to the vertical board or a gage glass.

After trying many types of valve layouts at the intake end of the gage, the author has come to believe that one particular arrangement is the most satisfactory. Into a ¼-in. T-pipe (0.364 i.d.) three ¼-in. lever-handled Lunkenheimer valves are permanently set, and nipples with smooth tapering corrugations are set into the other ends of the valves. The whole assembly, forming a large T, is then chromium plated. When the gages are put together, the T is turned thus: ⊢. The pressure tubing from the water pipeline is forced snugly on the taper of the leg of the T and fastened with two or three tourniquets of wire. The tapered lower end of the T is connected by a 3-in. piece of pressure tubing to the top of the lower gage glass, while the remaining taper, now pointing vertically upward, is provided with a short waste pipe of approximately 3 ft. of pressure tubing, the open end of which is placed in a bottle. If there should be an accident in "blowing off" the gage to remove air from the gage assembly, this bottle serves as a mercury trap.

Usually the gage is not filled until it is erected in the field. Since it is fairly delicate, it is better to wire or screw, rather than nail, the gage board to a previously plumbed post. If two or three screws are used, the gage board can be taken off at night and replaced in the same position the next morning. Over the top of the upper gage glass, a short piece of rubber tubing about 3 in. long is slipped, and a small glass funnel is placed in it. Into this is put a paper cone with a pinhole in the bottom. The mercury is then poured into the paper funnel and filters, drop by drop, through the pinhole, leaving all scum and dirt on the paper. If poured directly into the gage assembly, the mercury generally forms plugs with air bubbles between, which may be hard to eject. Bubbles in the glass parts of the gage can be seen, but any occurring in the blind pipe lengths are not visible and will introduce unexplainable errors in the results.

The mercury column rises in both legs of the U-tube. When the lower gage glass is nearly full, a thin stream of water is cautiously admitted into the gage from the pipeline by slowly opening the valves in the gage assembly. Air and water under pressure will depress the mercury in the lower and raise it in the upper leg. More mercury is now poured in until finally the two valves can be thrown wide open and the pressure in the main pipeline is balanced by the differential mercury column. In addition to water, the rubber tubing and gage glass will contain air, which, by careful manipulation of all three valves, can be "bounced" out of the lower gage glass and expelled through the waste tube into the bottle. The operator now has a short "low glass" on the intake end of the

U-tube and a longer "high glass," perhaps with one or more lengths of iron pipe between it and the U bend. If the valve from the water line is closed and the waste valve opened while the gage valve is partly open, the pressure of the long leg of mercury will drive the mercury right out the waste pipe. The bottle trap now catches the mercury but allows the water in the gage to flow out the top.

Nearly all pipes, especially those with a pump somewhere in the line, cause the mercury in a U-tube column to pulsate so that accurate readings are impossible without "throttling." The two valves between the water pipe and the gage glass are closed very slowly, one at a time, damping the mercury meniscus more and more until it is "just alive." The mercury in both the upper and lower gage appears as a bright, sharp arch in the glass and can be read to the nearest thousandth of a foot without difficulty.

Before the actual gage readings, all air valves along the reach to be tested should be checked for free automatic operation. Air locks can ruin a good test. Readings at five-minute intervals for an hour or more are usually satisfactory, although reducing the intervals below three minutes increases reading difficulties. When both the upper and lower mercury meniscuses have been recorded, the two valves between the mercury column and the water main are opened wide and the column allowed to pulsate for a few moments. After three or four readings, the gage valve, just above the mercury column in the lower gage, is closed and the waste valve opened. This expels any air bubbles that have accumulated in the tubing and cools the water column between pipe and gage. The waste valve is then closed and the others opened, whereupon the mercury again moves to a balance, and the pulsations are damped. The next reading can then be taken. If possible, the gages should be set on the shady side of the post so that shade temperatures are recorded, including those of both air and water. If a gage at one end of the reach is quite short in comparison to the other, an error in over-all losses will occur due to the use of an improper specific gravity coefficient in converting the mercury columns to their water equivalent. The specific gravity of the mercury at its particular temperature is computed as a balance against the pressure head, indicated by the specific gravity of the water at its particular temperature. This last point explains a common error made in tests on reaches short enough to enable a single differential gage to be used. If such a gage is placed midway along a 1,000-ft. reach of pipe and small pipes or tubes are used to bring the piezometer indications to the two legs of the gage, differences in the temperature of the two tubes can easily exceed the true difference due to loss of head in the main pipeline under test.

The elevation of the gage zeros is determined by running a checked line of levels between the ends of the reach, or else each gage is tied to the scheme of levels by running a checked line from an accepted bench mark near the gage site. All trunk lines should have an accurate set of bench marks. Whatever the type of gage at the ends of the reach, L, the data given can be computed to show the elevation of the top of an equivalent water column on the hydraulic gradient immediately above the pipeline at the location of the piezometer taps. The difference in elevation of the gradient between the

upper and lower ends of the reach shows the loss of elevation or "head" for the pipeline, including all specials, valves, and so forth. The fall of the energy gradient is the element desired. If the pipe is the same size throughout, the velocity is the same at the two ends of the reach, and the fall in the energy gradient is identical with that in the hydraulic gradient. When the gages are located on different sizes of pipe, the velocity head, equal to $\frac{V^2}{2g}$ at each gage, must be added to the elevation on the hydraulic gradient to give the energy gradient.

Color Test

Since the essentials of timing are the same whether color, salt or other material is employed, the direct method of obtaining the velocity, V, will be described only for color. Using a color gun, a cloud of fluorescein, potassium permanganate, congo red, methylene blue or other powerful color, in solution, may be blown into the water prism through one of the air valves or even through the tap for a piezometer connection. An air valve can be removed after closing the valve between it and the pipeline. In place of the air valve, a unit with the same threads may be provided with a stuffing box, enabling a hollow tube from the color gun to be thrust down into the flowing water after opening the large valve underneath. The gun is filled with concentrated color, and the pressure in the air reservoir is increased with an auto pump until it exceeds that in the pipeline by about 25 psi. For a small pipeline the gun-valve can be opened and closed almost in the same instant. For large pipes the author dissolves about two tablespoons of fluorescein in a pint of limewater to obtain a dense, reddish fluid. When later observed in the flowing water, the reflected color is bright green. The color concentrate starts to enter the pipeline at the opening of the valve. Several seconds later the timer can hear the air behind the color blowing into the pipe. The mean time of the start is taken as half of the interval between the opening of the valve and the hiss of air. At the location where the color is observed, the time difference between first sight of color and last sight is from 6 to 8 per cent of the time spent in the pipe. Accepting the average between first and last sight assures the accuracy of the timing within a maximum of 4 per cent and usually within approximately 2 per cent. Where opportunity offered, color velocities were checked against Venturis, weirs of various types and current meter gagings. The divergence was from 1 to 3 per cent.

The timing of confetti, bran or other visible indicators is similar to that for color. There is a very elaborate apparatus for measuring salt solution, using the titration process, for which great accuracy is claimed, even when it is applied to relatively short reaches of pipe. Many may regard a traverse with a Pitot tube as a "direct measurement," but actually it measures local velocities at many points in a single cross-section of pipe, thus falling into the class of indirect methods discussed below.

The choice of materials must depend on circumstances. It may be unwise to color a reservoir near a city a brilliant green. There are no taste or toxic properties in fluorescein, but the green color remains for a long time. Permanganate breaks down rather quickly —perhaps too quickly—but it is least objectionable.

Indirect Measurement

The indirect method of learning the velocity—measuring the quantity of flow, Q, and dividing Q by A, the area of the pipe section—is the one most commonly employed in water works practice, as nearly all trunk lines are provided with some type of quantity meter. The process depends on the accuracy of the meter and the determinations of the actual interior dimensions of the pipe. Wherever possible, the author prefers the direct method and only uses the meter as a check. It is only occasionally that the engineer who measures municipal trunk lines is required to use a weir, orifice or similar device. In recent years

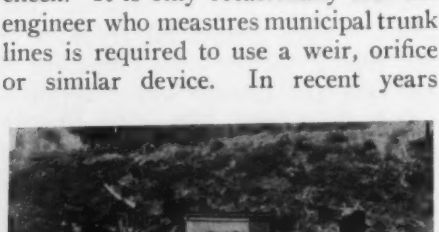

FIG. 3. Testing Velocity on Low-Head Line

lines have been provided with "orifice plates" on which some calibration work has been done, but the author still regards them as needing fuller verification, because the clean edges required of the orifice quickly become fouled in most lines to such an extent that the results are questionable. A traverse across the two legs of an X with a modern pitot tube provides a measurement of Q which is divided by A to get the mean value of *V at that section of pipe*. A traverse across an X is better than across a +, as the former avoids trouble with air bubbles that travel along the zenith of the pipe. Although a pitot tube measures local velocities directly, it does not measure the mean V in a pipeline directly. It is still necessary to know the average diameters throughout the pipe, rather than just the one diameter of the section measured.

Figure 3 shows a layout used by D. W. Proebstel of Portland, Ore., for tests on a low-head line. The three columns at the left indicate piezometer gradient points only, and the adjoining columns are from pitot tubes set in an X across the pipe. The higher columns in the middle of each group are due to high center velocities compared with those nearer the shell of the pipe. The gages are "read" by camera.

Tabulation of Results

With the field tests completed, the final values of V, h_f, and D (in feet) or d (in inches) are computed and checked. Certain formulas, like the Williams-Hazen, require the value of the hydraulic radius, r. This equals $\frac{D}{4}$ and is easily found once D is determined. Likewise, in place of H,* the loss per thousand feet of line, some formulas, such as those of Kutter and Manning, require the slope value, S,* in fractions of a foot per foot of pipe length. It must be remembered that the slope of the hydraulic gradient is only applicable if the pipe reach is of the same diameter throughout, making the hydraulic gradient and the energy gradient parallel and equal. If the diameter of the pipe varies, the energy gradient should be the measure of loss. All types of piezometer gages show points directly on the hydraulic gradient, not on the energy gradient.

The research data should be given in tabular form and should include at

* $H = \frac{1{,}000\ h_f}{L} = 1{,}000\ S.$

least the values of V; H; D, d or r; and L. The values of Q, T (temperature for both water and air), the average values of pH, the value of C in both the Chezy and Williams-Hazen formulas, and the friction coefficients of any other formulas are also desirable. If the Reynolds number **R** has been computed, it should be given, together with the temperatures upon which the kinematic viscosity was based. Broad deductions must not be drawn from meager data. The mere fact that Kutter's n appears to satisfy the elements found on one trunk line does not justify the statement that Kutter's formula should be used for the design of similar lines. The author can show conclusively that the Kutter formula should not be used as a general formula for designing pipelines, although it is most useful for open channels.

The tabulation of the total losses for the length L should be followed immediately by a column showing the unit losses, preferably in terms of H. All columns should be headed by the unit in which the data are given, to prevent confusion.

The tests must be described in sufficient detail for the reader to make his own deductions about the relative merit of the data. If known, details should be given on horizontal and vertical curvature, all reductions and expansions, and valves and other specials. The methods of measuring the elements listed and any necessary intermediate measurements should also be reported.

Attempts should be made to have tests repeated as frequently as practicable. An operator will often find trouble that he would have been glad to know about months before. By preserving conditions at gage points, repeat tests can be made with a minimum of time and personnel. Reference should be made to local bench marks close to gage points, so that one sight with the level will tie a gage to elevations previously used.

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Reducing Unaccounted-for Water

By Charles Haydock

A paper presented on June 13, 1947, at the Western Pennsylvania Section Meeting, Pittsburgh, Pa., by Charles Haydock, Cons. Engr., Philadelphia, Pa.

UNACCOUNTED-for water means different things to different people; to the author it represents the water introduced into the distribution system and not recorded on customers' meters. In a completely metered system, unaccounted-for water can therefore be described as nonrevenue-producing water.

Regardless of how it is defined, unaccounted-for water is a drain on the system, both physically and financially, and its reduction will usually improve service to customers, reduce operating expenses, increase the useful capacity of the system or postpone the necessity for expansion. It may even achieve all of these results at once.

To speak of unaccounted-for water in a system presupposes a knowledge of how much water is introduced into it. That is, there must be master meters measuring the output from the source of supply to the distribution system, and the master meters must be sufficiently close to the source so that the loss of water between the source and the meters will be negligible.

The advantages of using master meters and metering all service connections have been so frequently discussed that they are now almost universally recognized. The number of systems which are completely metered, except for their public fire protection services, is constantly increasing. In such ideal situations, the amount of unaccounted-for water may be known, and the problem reduces to: (1) insuring the accuracy of the meters and (2) reducing the unaccounted-for water to the least possible amount.

Accurate Measuring

The higher the percentage of customers served through meters—particularly if all of the larger customer services are metered—the more useful the knowledge of the amount of unaccounted-for water becomes. If a system is not entirely metered, less water will be "accounted-for" on customers' meters, but knowledge of the amount will be useful just the same. In a system recently surveyed, only 8 per cent of the customers are metered, but this 8 per cent used 35 per cent of the water and paid 51 per cent of the total operating revenues.

Another system which is completely metered, except for its public fire protection service, sold 82 per cent of its water. This is an excellent record, for no estimates were included of unmetered water used for such purposes as flushing streets or fighting fires. Much higher percentages of water sold from completely metered systems have been reported, but it is noted that some of these include estimates of water not

passing through customers' meters, which, in the author's opinion, is not a logical approach.

It is estimated that there are 13,000 public water supplies serving 85,000,000 people in United States, and that a saving of 4,000 mgd. could be made if the unaccounted-for leakage and waste were controlled. There is no single method which is most advantageous, under all conditions, to reduce unaccounted-for water. Adequate control is just another of those problems requiring the constant attention of the water works manager if the system is to be efficiently operated.

Certainly a most important step is to ascertain that all meters, both at the source and on customers' services, are accurately registering all the water that passes through them. There are still many systems without master meters and also many which do not total the registration of customers' meters.

Water may be lost through meters which are not registering properly, through leakage in the distribution system or through unauthorized connections to the mains.

Selection of Meters

Securing accurate registration of the water passing through meters depends largely on properly proportioning the size of the meter to the rate of consumption. If a customer's meter is too large, it may under-register at low flows; if too small, the loss of pressure at high flows may be excessive and may result in unjustified complaints of poor service. Frequently the rate schedule is an important factor in the customer's choice of meter size, so that it is important to the water system that the rate schedule include minimum charges in proportion to the size of the meter. Final choice of the size of the meter, however, should rest with the water system. There is much to be said in favor of having the size of the service line correspond closely to the size of the meter.

A maximum demand meter for water works practice, similar to demand electric power meters, would be a great boon to water works operators, as would also a simple, practical meter for rendering off-peak service, although it is not likely that the latter would be so universally applicable to water systems as to power systems.

The use of a battery of small meters rather than a single large meter is becoming more general as a means of improving accuracy of registration and avoiding estimated bills when it is necessary to remove a meter from service.

Meter sizes are seldom changed by the average system when there is a permanent change in demand, but such changes may lead to improved registration. Changes are also called for when the estimation of the rate of consumption which was made at the time of the original installation is incorrect. Recording portable rate-of-flow test meters are most helpful in determining the correctness of the size of the meter installation.

All four types of meters: displacement, current, compound and Venturi, have their proper application in measuring water; but their accuracy depends on proper maintenance.

A meter maintenance program should be well balanced. Larger meters usually pass the greater quantities of water and adequate maintenance will usually produce more returns, but water is sold through the many smaller meters at higher rates, so that a much smaller increase in registration, if it is general, will produce important increases in revenue.

Finding Leaks

Service men and meter readers move around the system constantly and have the best opportunity of observing or learning of leakage. Among the water system's best leak-locating friends are observant persons who promptly report the appearance of water in unusual places. It is the duty of water department employees to report actual and suspected leakage, but the co-operation of customers, the police and casual passers-by is most helpful.

A large leak usually is quite apparent unless there is a means of escape for the water below the surface of the ground, such as may exist at railroad or stream crossings, or near sewers. Excessive cover over pipelines may also mask large leaks, particularly if the fill contains loose rock or cinder. Cinder fills, like streams containing acid mine drainage or industrial wastes, are particularly dangerous, owing to the destructive action of the water on the outside of the pipeline.

Mains traversing a railroad line, particularly if they are not encased in protecting pipelines, frequently develop leaks. Such leaks not only cause much loss of water but are exceedingly dangerous if the roadbed softens and the railroad carries heavy or high-speed traffic. Stream crossings are also vital points where leakage frequently occurs and where it is difficult to detect, particularly if the flow cannot be shut off for testing. If the pipeline can be shut off, the presence of a leak may be indicated by loss of pressure, or a check can be made with a small meter on a by-pass around a closed valve feeding into the stream crossing.

Sewers may readily carry off leakage which does not appear on the surface of the ground, so that observation of sewage flow, particularly at night, is a helpful method of locating leaks. One such leak found by this method had been costing a system 500,000 gpd. Abandoned services and little-used pipelines are also frequent offenders.

Leaks not appearing on the surface of the ground may be indicated by the melting of snow or the appearance of dew. Aquaphones and similar listening devices are also most helpful in locating leaks that do not appear on the surface. If there is not too much interfering noise, meter readers can at times detect leaks by the sound of their vibration, without using artificial listening devices. There has been a great improvement in recent years in listening devices, although some are now so sensitive that they are difficult to use, except when conditions are exceptionally quiet.

Probably the most accurate method of determining where the unaccounted-for water disappears is by a leakage survey. The system may be divided into districts and measurement made of the flows into the districts by day and night. This is an expensive procedure, but often results in substantial savings to the system.

A simpler, but less efficient, method is to check pressures and flows when hydrants are flushed. A map showing the hydrants and their flows, perhaps by colored head pins, will be useful and will also be helpful in designing improvements to the distribution system. Recording pressure gages at strategic points may be useful to locate larger leaks or drafts. Determining and plotting the hydraulic grade line of a long transmission line will also indicate the location of any heavy draft or leakage by the change in slope of the hydraulic grade line.

Unbilled Consumption

Unauthorized connections to water works systems resulting in surreptitious use of water are illegal and fortunately rather rare, although some are found from time to time, particularly in older systems. Sometimes these connections are unknown both to the customer and the water system. They may not only cause a loss of revenue, but may be a hazard to the health of the community as well, if the unauthorized connection results in a cross-connection with a source of water supply not approved for drinking.

For one reason or another, water taken from a distribution system may not be billed. This condition usually results from long usage and uncertainty about the respective rights of the water system and the user. Sometimes the water service is considered as a donation. These are questions of policy not properly pertinent to this discussion, but good business practice is to resolve such relationships so that the water works system can be operated on a sound basis.

Unfortunately, unaccounted-for water is a standing problem in a water system, and it is a constant battle to keep it down to a reasonable figure. If it can be reduced, however, the effect is substantially the same as increasing the size of the system, for, without making capital additions, additional water is made available for sale to customers. Thus service may be improved and the over-all efficiency of the system increased. It should be remembered that water which does not produce revenue costs just as much as water that is sold at the highest rate.

Discussions

G. V. Gustafson

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Opportunity for a double check on the quantity of water accounted for is afforded the Wilkinsburg-Penn Joint Water Authority, which not only has completely metered its customer services, but has installed measuring devices on the pumps serving the filter plant and Venturi meters on the mains leading from the filter plant. This system, therefore, affords an example of accurate measurement of water.

History and Territory

The Wilkinsburg-Penn Joint Water Authority purchased the properties of the Pennsylvania Water Co. on May 15, 1946, for operation and management under the provisions of the Municipality Authorities Act of 1945. The authority management, therefore, has been in operation for only slightly over a year. The practices of measurement and control of water delivery as originally developed for the Pennsylvania Water Co. by Charles L. Fox and the late William C. Hawley, however, have been unchanged by the present general manager, C. H. Davis.

The Pennsylvania Water Co. was chartered in 1887 to serve what was at that time Sterrett and Braddock Townships in Allegheny County, Pa. Construction of the original water works was begun in 1889, and expansion was rapid during the next three years. In 1902 a merger with seven other water companies was completed, and the latest acquisition of the company prior to its sale to the authority was made in 1928, when a merger was effected with the Trafford Water Co.

The authority serves water at retail in the Thirteenth Ward of the city of Pittsburgh, in thirteen boroughs and five townships; and at wholesale for redistribution to one water company, two boroughs and one township, all lying between the Allegheny and Monongahela Rivers east of Pittsburgh. The principal industrial area lies along the Monongahela River and Turtle Creek, concentrated mainly in the boroughs of Swissvale, Rankin, Braddock, North Braddock, Turtle Creek, East Pittsburgh and Wilmerding. The remainder of the territory is primarily residential.

The larger industries served include the Westinghouse Electric Co., Westinghouse Airbrake Co., Westinghouse Foundry Co., Union Switch and Signal Co., Union Railroad and the Universal Atlas Cement Co.

Description of Plant

Water taken from the Allegheny River is raised by steam-driven centrifugal pumps to a gravity filtration plant, and flows from a reservoir adjacent to the filter plant directly into the distribution system.

Daily records of pumpage are maintained, measurement of flow from the pumps being made through thin plate orifices located on the outlet of each pump. Water delivered is measured by flow meters of the curve-drawing and dial-indicating types.

Flow from the reservoir adjacent to the filter plant is measured by two venturi meters, and records are maintained of the daily registration. All water for domestic, commercial and industrial use is measured, the system being completely metered. Meters have been furnished and installed at the expense of the utility since 1917.

The distribution system consists of approximately 250 miles of cast-iron pipe ranging in diameter from 4 to 42 in. The irregular topography and steep hills necessitate the use of five booster pump stations and seven elevated storage tanks. A total of four open type reservoirs with a combined volume of slightly over 32 mil.gal. provide storage for filtered water.

Permanent pitometer stations are maintained on transmission mains for study of leakage and flow characteristics. Valves are checked regularly for leakage and operating condition. Hydrants are tested in the spring and fall, and records of static pressure are maintained.

Pumpage and Unaccounted-for Water

During the past seven years, from 1940 through 1946, the average yearly pumpage has been 5,495 mil.gal., or approximately 15 mgd. Of this pumpage the average yearly sales amounted to 4,712 mil.gal., leaving a combined non-revenue-producing pumpage of 783 mil.gal., or slightly over 14 per cent. This percentage includes the water used for washing filters and for operation of the plant and properties of the authority. Wash water is accurately measured, and water used by the authority for boilers and other purposes is metered. The total water uses of the utility averaged 229 mil.gal. per year. When added to the sales, this amount leaves a total of 544 mil.gal. unaccounted for, or approximately 10 per cent. The amount of water accounted for is therefore 90 per cent of the total pumpage. No allowance is included in the accounted-for water for fire protection service, hydrant flushing, evaporation from reservoirs, meter slippage

or other unmetered demands (see Table 1).

The percentage of unaccounted-for water has been recorded since 1922 and has been consistently low. A seven-year average is presented to eliminate yearly variations in sales figures which result from continuous billing of quarterly accounts and other such variables.

A large part of the credit for the low percentage of unaccounted-for water is due to the efficient program of inspection and testing of meters which was carried on by the company and has been continued by the authority. Two meter repair shops are maintained, and the present program calls for testing ¾-in. meters either every seven years, or when registration reaches 100,000 cu.ft. Every six years, or when registration reaches 150,000 cu.ft., ¾-in. meters are tested, and 1-in. meters are tested every five years, or when registration reaches 300,000 cu.ft. All larger meters are tested every four years. At present, approximately 600 meters are tested monthly.

Wash water and other requirements for water at the filter plant do not pass through the Venturi meters. An accurate check of the pumpage figures can therefore be made from the venturi records. Meter registration for the seven-year period averaged 5,338 mil. gal. Use at the filter plant averaged 125 mil.gal., making a total of 5,463 mil.gal., or only 0.6 per cent of the pumpage as recorded from the orifice meters on the pumps. This is a very small differential and commends the accuracy of the records kept and the maintenance of the recording equipment.

TABLE 1

Water Accounted for From 1940 to 1946

	Yearly Avg. Quantity			
	mil.gal.		*per cent*	
Water pumped, yearly avg.		5,495	100.0	
Filter plant uses	125			
Loss between pumps and Venturi meters	32	157	2.9	
Water delivered to distribution system, avg.		5,338	97.1	100.0
Metered sales	4,712			
Authority metered uses, distribution system	104			
TOTAL ACCOUNTED FOR		4,816	87.6	90.2
TOTAL UNACCOUNTED FOR		522	9.5	9.8

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In 1918, when the author became superintendent of the Kensington Water Co., the capacity of the plant was 3 mgd. The average consumption the next year was 2.660 mgd. A year later, it had risen to 2.770 mgd.

With operation approaching closer and closer to the capacity limits, it was recognized that measures would have to be taken either to reduce the consumer demand or to enlarge the plant.

A new rate schedule was therefore filed in 1921 to eliminate all flat rates and in effect increase the charges. All services were metered and a Venturi meter was installed at the pumping station to record the output. As a result, the average consumption in 1922 was reduced to 1.907 mgd.

By 1924, however, consumption rose again to 2.342 mgd., and the unaccounted-for water in the first quarter of that year was as high as 37.35 per cent. Action to reduce this waste was clearly necessary.

TABLE 1

Water Unaccounted for

Year	*per cent*
1928	18.50
1929	19.70
1930	14.47
1931	12.90
1932	9.28
1933	11.10
1934	11.80
1935	8.76
1936	13.11
1937	11.80
1938	11.48
1939	12.10
1940	12.62
1941	14.20
1942	14.22
1943	11.37
1944	13.50
1945	16.90
1946	15.50

The engineering firm of J. N. Chester was retained to make a pitometer test of the meters of all industrial customers. As a result, compound meters were installed on all these connections. In the course of the tests, one by-pass line was found with a broken seal, through which water was being taken without authorization. No theft was intended, and the situation was attributed to the carelessness of an employee. The customer agreed to pay for an estimate of 10 mil.gal. of unmetered water.

A pitometer survey of the distribution system also uncovered several bad leaks. One particularly bad one under a concrete street, where it might never have become visible, resulted from a leaking joint and was costing the system about 8 mil.gal. per month.

The average consumption for 1925 was reduced to 2.104 mgd. Table 1 gives the water unaccounted for since 1928. The increase in 1945 and 1946 was caused by a very bad break in the reservoir, which has since been repaired.

To determine the importance of meter repairs, many years ago, 100 meters were taken at random and repaired. Registration before repairs amounted to 2,701 cu.ft. per quarter; afterwards, for a similar period, registration increased to 3,392. The increased revenue per meter amounted to $5.52, which offset the $4.58 repair costs and left a net gain on the operation of 94¢ per meter.

The authority intends to set up a five-year program and bring all the meters into the shop for testing and repair. It is hoped that the percentage of revenue-producing water will be increased by this program. Wartime shortages of meter parts and qualified labor are still serious, but the job will be begun as soon as possible.

Disposal of Water Purification and Softening Plant Wastes

A Preliminary Committee Report

A report presented on July 22, 1947, at the Annual Conference, San Francisco, by three members of Committee W–8—Disposal of Wastes From Water Purification and Softening Plants. The instructions to the committee state that its duty is: "to study and report upon methods and practices of disposing of sludge or skimmings from clarification units, sludges from lime or lime-soda plants, brine from zeolite softeners and wash water from filters of all types." This first report, by William W. Aultman, Water Purif. Engr., Metropolitan Water Dist. of Southern California, La Verne, Calif.; Paul D. Haney, Assoc. Prof. of San. Eng., Univ. of North Carolina, Chapel Hill, N.C.; and Harry R. Hall, Chief Engr., Washington Suburban Sanitary Com., Hyattsville, Md., consists of papers covering very generally the entire field as outlined in the instructions. These articles merely point the way to further study and will be used as a basis for later investigations.

Lime and Lime-Soda Sludge Disposal—*William W. Aultman*

SLUDGE disposal is a problem which is daily assuming greater importance for the designers and operators of water softening plants using the lime or lime-soda method. There appear to be three major reasons for this increasing awareness: (1) consumers are fast becoming "soft water conscious" and are requiring that hardness be removed from local supplies, thus necessitating the construction and operation of more softening plants; (2) the nation is more "pollution conscious" and is enacting laws which prohibit the dumping of waste materials into streams or watercourses; and (3) the general increase in population of urban regions has caused the sectors in which softening plants are located to be developed and built up, thus both raising the value of the land upon which sludge may be dumped and making such disposal areas a distinct public nuisance.

Character of Wastes

The sludge produced during the softening process consists principally of calcium carbonate, but contains varying amounts of magnesium hydroxide, aluminum hydroxide or other coagulants, and possibly colloidal material and organic matter removed from turbid waters. It is the minor constituents in the sludge which make the handling and disposal of this waste product more difficult. The type of water treated and the degree of softening practiced will determine the amount of these constituents. By far the greatest number of softening plants deal with clear water from wells, but many of the larger plants are located on rivers where flood con-

ditions produce a very turbid water at certain times of the year.

Disposal Methods

There are, at the present time, four general methods for handling softening plant sludge. The first is the simple lagooning of the wet sludge with two or more basins being operated alternately, so that the excess moisture may be skimmed off or permitted to evaporate (1). The vast majority of the plants use this means of disposal. In order to store the sludge in lagoons, Hoover estimates (2) that 0.00211 acre-ft. of lagoon storage space is required for each million gallons of water softened. Fortunately, the sludge can usually be lagooned with only a negligible nuisance resulting, but, occasionally, if a heavy plankton load or other organic matter is present in the water, disagreeable odors may occur as decomposition takes place.

The second method is the discharge of the wet sludge into a large stream or watercourse, allowing the water to wash it downstream away from the point of discharge. A possible combination of the first and second methods is the intermittent lagooning of sludge during low water flows and the sluicing of the sludge into the stream during high water periods. Only those plants located on a relatively large stream or watercourse can dispose of the sludge merely by dumping it into the stream bed. The present tendency, however, is toward the prohibition of this practice by state or national law, in order to eliminate further pollution of the streams. It is quite probable that favorably located plants may soon find themselves facing the same problem which confronts plants in the southwestern part of the United States, where no large streams are available.

The third method is to dry the sludge, either partially in the lagoon or completely by a dewatering, "flash" drying process, and use it in agriculture or as a filler in the manufacture of roofing materials, plastics, rubber, paint, millboard, chicken feed and the like. A few plants located where acid soils are prevalent have successfully disposed of the partially dried sludge from the lagoon as a soil sweetener, but most plants have been unable to induce the local farmers to remove the sludge from the lagoon to put on their land. During the war one plant disposed of its sludge by pumping it directly from the settling basins to a small operator who dewatered and dried it for use as a paint filler. Plants are reported in which the sludge is dried, sacked and sold (3). Dewatering and drying processes are entirely satisfactory, do not require much supervision, and can be worked with a relatively small water plant. Processing the sludge in this manner depends upon obtaining a permanent market for the dried material; otherwise its disposal is almost as difficult as that of the wet sludge.

The fourth method of sludge disposal, and the one which looks most promising for the future, is to dewater and calcine the sludge in order to recover the lime (CaO) for re-use in the softening process. Theoretically every pound of lime added to water containing carbonate hardness produces 3.57 lb. of sludge which can be dried and calcined to give 2 lb. of lime. In actual practice, 100 per cent recovery is not obtained, but more lime can usually be produced than is required for the softening process. This method has been investigated for years in the United States, but very little of a practical nature has been done about it. It appears that the hurdle has finally

been cleared, however, and three calcining plants, each of a different type, will be in operation in 1948 or 1949. These are described briefly below.

According to Hoover (4), in 1938 there were five principal reasons why the reclamation of lime from softening plant sludge had not been adopted in the United States: (1) most of the larger plants are adjacent to sizable waterways into which the sludge can be dumped; (2) because many of the larger plants soften and purify river water supplies, the ever-changing water and the resultant variation in sludge quality make the reburning of sludge quite complicated; (3) it has only recently become possible to prevent the accumulation of magnesium in the reclaimed lime; (4) satisfactory calcining equipment, particularly for small quantities of material, was not available; and (5) although small communities usually obtain from wells a water supply that is clear and lends itself to a reburning scheme, these communities did not wish to adopt an untried procedure.

Conditions affecting these five reasons have changed somewhat during the past nine years. As more stringent stream pollution measures are enacted, even plants situated on large streams may be enjoined from continuing to pollute them with this relatively insoluble material. Variations in the quality of a raw water supply cannot be controlled, although several cities are endeavoring to obtain sufficient reservoir capacity ahead of the plant to smooth out, at least partially, the peaks in quality fluctuations. Lime reclamation units could be employed at some of the plants located on a fluctuating supply by operating the equipment only when the water is relatively clear and storing the excess lime produced during this period until the water is turbid. To prevent the building up of the undesirable magnesium in reclaimed lime, two methods have been devised: use of a split treatment which generally precipitates the magnesium separately from the calcium, as in the Lykken-Esterbrook or the Hoover processes (5); or physical separation of the magnesium hydroxide from the calcium carbonate in a centrifuge during the dewatering of the sludge (6).

Calcination of Sludge

The rotary kiln has long been used satisfactorily to calcine materials comparable to those produced during the softening process (6, 7), but the efficiency of operation of such a unit is generally directly proportional to the amount of material being handled. Moreover, such a kiln for the small water softening plant would be a major piece of equipment, involving as much or more operating supervision than the water plant itself. Consequently, the adoption of lime reclamation processes has been obstructed. Multiple hearth furnaces have been used for this purpose, but investigations subsequent to those reported (5) have indicated that furnaces operating at the high temperatures required for lime calcining have required an unusual amount of maintenance to keep them functioning properly. Developments in the last few years may have improved their operation.

Two calcining furnaces which appear to solve the problem for the small plant operator have been designed and are being tested. One was developed by H. V. Pedersen, Supt. of the Water Dept. at Marshalltown, Iowa, in conjunction with the Raymond Pulverizer Div. of the Combustion Engineering Corp. (8, 9); and the other is the so-called FluoSolids system developed by

the Dorr Co. Both are stationary, vertical units which can be made to handle both small and large quantities of material. At present the reports of their operation look promising.

Lime Reclamation Installations

What is actually being done about lime reclamation? At Southend, England, the lime reclamation plant which has been in operation since 1929 continues to function, apparently satisfactorily. Because no provision is made there to separate the magnesium from the sludge, the quality of lime produced gradually deteriorates until it is necessary to "sweeten" the product at infrequent intervals with new commercial lime.

The city of Miami, Fla., is building an 80-ton-per-day rotary-kiln lime calcining plant to operate with its water softening plant, which will have a capacity, by the time the calcining plant is completed, of 60 mgd. The calcining plant will cost approximately $540,000 and is expected to be ready for operation in the fall of 1948.

After six years of experimental work, H. V. Pedersen is ready to go ahead with the construction of a permanent lime reclamation plant at Marshalltown, Iowa, embodying the Flash Calcining Furnace. As soon as materials are available the Marshalltown Water Dept. is planning to build a 10-ton-per-day sludge drying and calcining plant to operate with its 4-mgd. water softening plant. This lime calcining plant is expected to operate only 8 hours per day, because Mr. Pedersen's studies indicate that it will cost less to use a 10-ton plant for 8 hours than a smaller plant for a longer period of time.

The Dorr Co. is successfully employing several full-size units utilizing the FluoSolids principle on materials other than softening plant sludge. The company has completed extensive laboratory investigations in the calcination of softening plant sludge which indicate the feasibility of using this process for lime reclamation. A 6-ton-per-day FluoSolids plant to be used with a 20-mgd. water softening plant will be completed early in 1948. This calcining furnace produces a very unusual pelletized, almost dust-free, finished product.

The Metropolitan Water Dist. of Southern California has continued its investigations on lime reclamation and plans to design a lime calcining plant with a capacity of 50 tons per day for use at its 100-mgd. water softening plant at La Verne.

Summary

What are the prospects for the future? The only solution to the problem appears to be either to dewater and dry the sludge and then dispose of it commercially, if a market can be found, or to go one step further and calcine it, reclaim the lime for re-use in the softening process and sell the excess lime produced. Under present market conditions the excess lime could be sold readily. Studies indicate that lime thus produced generally costs no more, or possibly less, than commercial lime, even when no credit is taken for the value of sludge disposal or the carbon dioxide produced.

The results of the three new lime reclamation plants in the United States will be watched with much interest by many water softening plant operators and design engineers.

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Brine Disposal From Sodium Zeolite Softeners—*Paul D. Haney*

WASTES from sodium zeolite treatment plants consist of wash water containing the waste products of the regeneration cycle plus unused salt. These waste products are composed principally of the chlorides of calcium and magnesium, together with small amounts of various compounds of iron and manganese.

Quantity of Wastes

Wash water requirements will usually vary from about 5 to 10 per cent of the amount of water treated, although substantially higher percentages occur. The waste wash water will contain chloride ions (principally from sodium, calcium and magnesium compounds) proportional to the amount of salt used in regeneration. This will usually be 0.4 to 0.5 lb. of salt per 1,000 grains of hardness removed. The amount of chloride ion per million gallons of water softened which must be disposed of in the wash water may be approximated by the formula $C = 35SH$, in which C represents the chloride ion, expressed in pounds per million gallons, S is the salt, in pounds per thousand grains of hardness removed, and H is the reduction of hardness, in parts per million as calcium carbonate ($CaCO_3$).

Effects of Wastes

Significant increases in chloride, sodium, calcium, magnesium, solids and hardness concentrations will be noted unless ample dilution water is available.

The U.S. Public Health Service suggests that (1):

> . . . the following chemical substances which may be present in natural or treated waters should preferably not occur in excess of the following concentrations . . . . Magnesium should not exceed 125 ppm. Chloride should not exceed 250 ppm. Total solids should not exceed 500 ppm. for a water of good chemical quality. However, if such a water is not available, a total solids content of 1,000 ppm. may be permitted.

Solids of the type added to water by zeolite wastes cannot be removed readily by ordinary water treatment methods. Calcium and magnesium can be reduced by a combination of lime and soda ash treatment, but the chloride will remain unaffected, and the total solids after such a treatment will be greater than before. Damage to a water supply by salt wastes from sodium zeolite plants or from any other source is irreparable, as far as any treatment method now available for use by a public water supply is concerned.

If brine wastes are discharged into a sanitary sewer system, the question of their effect on the functioning of the sewage treatment plant and sewage pumping stations must be considered. Brine wastes may cause corrosion of pumping equipment and force mains, and, if these wastes reach the sewage treatment plant in a "slug," they may cause a serious upset in the biological phases of the treatment, in addition to corroding plant equipment.

Fish may be killed if brine is released and travels downstream in a slug. Limiting concentrations are not definite, however. Certain fish may be able to tolerate from 5,000 to 10,000 ppm. of sodium chloride for short periods, but calcium and magnesium chlorides appear to be more toxic (2). Concentrations which will allow the maintenance of good varied aquatic life are far lower than the values that fish can tolerate for short periods.

It is believed that a total salt content of approximately 1.5 per cent (15,000 ppm.) should be considered the upper limit for stock water (3). For lactating animals the limit is lower and much less highly mineralized water is, of course, preferable regardless. The damage to animals appears to depend not so much on the kind as on the amount of salt present. Experiments with chickens, hogs, sheep and cattle have proved that waters containing high concentrations of such salts as sodium, calcium and magnesium chlorides are injurious to these animals (3).

Disposal Methods

1. *Evaporation Ponds.* Except under very unusual conditions, evaporation does not appear to offer a satisfactory means for the disposal of zeolite plant wastes. Studies made in Kansas of the disposal of oil-field brines have indicated (4) that the evaporation of the brines may be less than—or, at best, may barely exceed—the rainfall. Evaporation data for fresh waters are not applicable to brines because of the lowering of the vapor pressure of the water by dissolved salts. Any evaporation which does occur serves to increase the concentration of the dissolved salts, further lowering the vapor pressure and retarding evaporation. This cycle continues up to the point of saturation. But even if evaporation is successful, there remains the problem of disposing of the residual salts.

Where soils are porous, watertight ponds may be quite expensive to construct. Brine seepage from a poorly built pond may cause mineralization of near-by surface streams and ground water supplies. Many ponds intended for the "evaporation" of oil field brines have actually proved to be seepage ponds (Fig. 1). Practically all of the water loss from them has been due to seepage into the surface drainage or into a shallow aquifer.

2. *Uncontrolled Dilution.* Discharge of the salt-bearing wash water into a stream, directly or by way of a city sewer system, offers a simple means of disposal, provided *adequate* dilution water is available. The amount of dilution water must be great enough at the time of the brine discharge to dilute the wastes so that water users and aquatic life downstream will not be damaged. This method of disposal is entirely dependent on the availability of a large quantity of dilution water and therefore cannot possibly be used in handling the wastes from many zeolite plants, or wherever the flow of the receiving stream is intermittent.

3. *Controlled Dilution.* Disposal by controlled dilution requires short- or long-range storage of the brine wastes in suitable reservoirs, followed by their discharge into the stream or the city sewer system. A short period of storage will permit an adjustment of the rate of release to correspond with the ability of the sewage plant or the receiving stream to dilute the wastes satisfactorily, and will prevent the discharge of "slugs" of brine. Storage over a long period will involve holding the brine in suitable reservoirs until adequate dilution water becomes available.

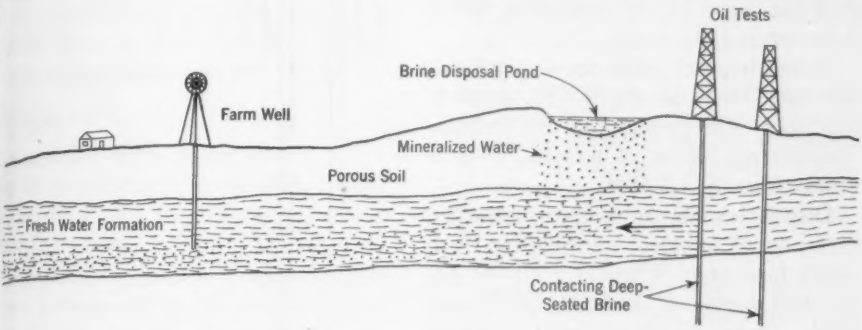

FIG. 1. Effect of Seepage From Oil-Field Brine Disposal Pond

If limiting values for the various constituents found in zeolite wastes are established for a given stream, the flow necessary to dilute the wastes may be formulated in terms of the concentration of the constituent normally present in the stream, the concentration of the constituent in the brine to be discharged, the brine flow rate, and the maximum allowable concentration of the constituent (after complete mixing) downstream from the point of brine discharge. Using the chloride concentration as an example, the formula is:

$$Q = \frac{q(B - C)}{C - A}$$

in which Q is the stream flow rate in any convenient units; q is the brine flow rate in the same units as for Q; A is the normal chloride concentration of the stream in parts per million or other convenient concentration units; B is the chloride concentration of brine in the same units as for A; and C is the maximum allowable concentration of chloride in the stream, in the same units as for A and C.

The disadvantages of this type of disposal lie in the cost of storage reservoirs and in the control of releases. Failure to build the reservoirs large enough to handle the quantity of brine produced during a period of low stream flow will inevitably result in the discharge of brine into the natural drainage at a time when the amount of dilution water is inadequate. Savings on storage reservoir capacity might be effected by temporarily holding back only that portion of the zeolite wash water which has a high mineral concentration and releasing the remainder of the water into a stream or sewer system.

4. *Brine Disposal Wells.* Brine disposal wells may offer a means for handling wastes, but probably only for a limited number of zeolite plants. Experience has shown such wells to be

a very satisfactory method for disposing of large quantities of brine from oil wells. Brine separated from the oil is gathered in specially constructed pipe systems (cement-asbestos or clay pipe) and, if suitable for direct disposal, conducted to a brine disposal well. If the brine requires treatment prior to disposal, it is brought to a plant where it can be conditioned for injection. Brine treatment may involve one or more standard water treatment processes, such as aeration, coagulation, sedimentation and filtration. Treatment is often necessary to prevent suspended matter from plugging the pores of the formation which is to receive the brine.

Brine disposal wells may vary from 400 to 5,000 ft. in depth (5), depending upon the geology of the region. The average depth of Kansas wells is approximately 1,200 ft.

Disposal wells must be constructed carefully to avoid contaminating fresh water horizons. Usually a 10- or 12-in. steel casing is set below all known fresh water horizons and grouted throughout its length by the Halliburton method (Fig. 2). The bottom plug is then drilled out and a 9-in. hole is drilled down to the top of the receiving formation. This is also cased and grouted and the inner casing is carried to the surface. Next the plug in the bottom of the 9-in. casing is drilled out and an open hole carried into and through the sandstone, porous limestone or granite wash formation which is to receive the brine. The open hole may vary in depth from a minimum of 30–40 ft. up to a maximum of 400–500 ft. Cement-lined steel tubing (5–6¼ in.) carries the brine from the well head to the top of the porous formation. An open hole extends from 50 to 500 ft. below the tubing. If the receiving formation is subject to caving, the tubing is gun perforated with ½- to ¾-in. holes and is carried through the formation.

Properly constructed brine disposal wells cost approximately $3.50 per foot for wells of minimum (400 ft.) depth, $5.00 per foot for wells of average (1,200 ft.) depth and $6.00 per foot for wells of maximum (about 5,000 ft.) depth. The outlay for oil brine disposal by this method varies

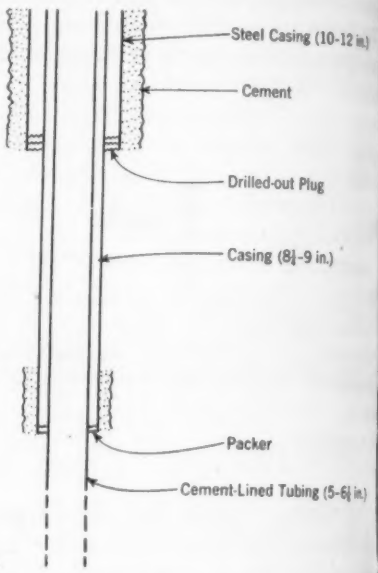

FIG. 2. Casing Scheme for Brine Disposal Well

considerably. In a large, well-organized brine disposal association set up to handle the salt water from 300 to 400 oil wells, the entire cost, including fixed charges, ranges from 0.8 to 3.0¢ per 42-gal. barrel of brine (5).

A serious problem arises when brine disposal formations become plugged with corrosion products, so that it is absolutely essential to avoid corrosion of the gathering and injection pipes. Any considerable amount of suspended

matter in the brine must be removed prior to disposal, and the brine should be conditioned so that it does not react with the receiving formation to produce precipitation.

It seems likely that even if a suitable brine disposal well could be made available, the wastes from a zeolite plant would have to be treated prior to injection, especially if the water treated contained appreciable quantities of iron and manganese. The continued necessity for treatment, together with the probable high cost of developing the proper type of well, makes it appear doubtful that brine disposal wells can offer a practicable means of zeolite plant waste disposal, except under very unusual circumstances.

Conclusions

Controlled dilution appears to offer the most generally applicable means of handling the wastes from zeolite softening plants, but even this method is unsatisfactory unless ample dilution water is available at the time of brine release and unless the releases are carefully controlled. Uncontrolled dilution is seldom satisfactory, although it may work for small cities located near large streams. Evaporation and brine disposal wells usually do not offer a practicable solution to the problem.

Because of the difficulties associated with the disposal of brine wastes, the use of the zeolite method as a means of softening municipal water supplies may often be precluded.

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Disposal of Wash Water From Purification Plants—*Harry R. Hall*

THE disposal of wastes from wash water and sludge discharged by conventional slow and rapid sand purification plants is a fit subject for discussion. The practice ordinarily has been to release the filter wash water directly into the nearest stream as the filters are washed and, when necessary —usually at times of high water in the stream—to empty coagulation or sedimentation basins in which alum or other chemicals are used to accelerate settling. A few settling basins or lagoons for intercepting the wastes have been installed from which the liquid is decanted continuously and the sludge discharged at high water or perhaps removed by excavation and used for filling. There seems to be no general procedure for treatment, because it has been the exception rather than the rule and has sometimes been adopted only after complaints have forced action. The methods used are, of course, dependent on local conditions such as the size of stream and the uses to which it is put. The disposal of purification wastes has not been given the attention it merits, however, and water works engineers

can expect that this problem will call for closer scrutiny in the future designing of filtration plants.

Character of Wastes

Wash water and sludge contain only what was carried by the raw water, plus chemicals added in the treatment process. If treatment involves the use of such chemicals as iron compounds and activated carbon, changes in the color of the impurities result, while pre-chlorination reduces the bacterial count. In effect, then, the waste returning to the stream differs little from that of the stream itself, except in concentration.

The wash water naturally varies in character during the discharge cycle and improves in condition toward the close of the washing process. Turbidities over 2,000 ppm. have been recorded, which fall to 50 or 100 ppm. at the end of the wash, depending upon how far it is carried. With a detention period of one hour, the wash water turbidity can be reduced to 40 or 45 ppm., and, if pre-chlorinated, the decanted liquid will be practically free from coliform organisms.

The sludge, according to one authority (1), is "slightly on the acid side," and the B.O.D. "might compare with that of a domestic sewage." "The odor is the most disagreeable feature and causes the most complaints from a nuisance standpoint." It is also reported that the coliform count in the sludge would probably be of better quality than any stream into which it might be discharged.

Examination of the sludge at one of the plants operated under the author's direction in the Washington Suburban Sanitary District, which was involved in litigation resulting from the discharge of filter plant wastes into a small stream, produced evidence not completely in accord with these conclusions. Abel Wolman testified that the examination of such a material for coliform content is not currently recommended in *Standard Methods* (2) since, because of the nature of the material and the methods of analysis, the results are admittedly subject to a certain range of error. Coliform densities are so low, however, as to indicate that the bacterial hazard in sludge mixtures is not of a high order. A comparison of the low organic content of this sludge with that of raw sewage is impracticable. The determination of the B.O.D. in sludge or mud is not provided for in *Standard Methods* (2), which renders meaningless the statement that the B.O.D. of the sludge "might compare with that of a domestic sewage." This point was corroborated, in the case cited, by the fact that an adjacent arm of the stream receiving the sludge showed a B.O.D. of 90 ppm. above the point of discharge —a most unusual figure for the highly turbid road wash the stream was carrying.

Quantity of Wastes

The quantity of wastes to be considered for disposal depends entirely upon the characteristics, particularly the turbidity, of the raw water, since this controls the frequency with which filters are washed and coagulation and sedimentation basins cleaned. These factors must be determined for each individual plant, but there are certain basic data, relating especially to the rates of discharge of wash water and the amount of sludge produced, that can and should be established as a guide in determining disposal requirements. So little information is available regarding sludge quantities and

other items, however, that nothing of value can be presented until further investigation is carried out.

Pollutional Effects of Wastes

The pollutional effect of the discharge of purification wastes directly into streams is, of course, governed by the size of the stream and the manner in which the discharge is controlled. The general lack of provision for any treatment whatsoever in most plants indicates quite plainly the extent to which these wastes have been disregarded as pollutants, probably because so many plants are located on large streams and because the concept of pollution is still confined to sewage and industrial wastes.

As stated previously, nothing is discharged into the stream except the actual amount of silt removed and the chemicals added in treatment. The silt is merely replaced as sludge in a more concentrated form and over a much shorter period of time. In periods of low stream flow the effect of wash water discharges on the stream may be noticeable, particularly where chemicals causing discoloration are used, but there does not appear to be evidence of pollution to the extent that public health is jeopardized.

Often careful control of sludge discharge during periods of high stream flow would not result in a very appreciable addition of solids to an already highly turbid stream. If prechlorination is practiced, it does not appear that the stream would be polluted by bacteria. Only rarely will fish and animal life be affected. Odors from sludge stored in basins and lagoons have been reported which might make the wastes a nuisance (1).

If streams are used for bathing or are impounded for the creation of pools or ice ponds, the effect of wastes on the physical character of the water, and possibly on the silting of ponds, may be objectionable unless the sludge discharge is properly controlled.

Disposal Methods

There are a number of ways in which wastes can be disposed of:

1. Direct discharge into the stream without treatment of any kind.
2. Discharge of all wastes into the sewerage system.
3. Discharge of wash water into sewers and sludge into lagoons or sludge beds, which are excavated after drying and used for filling low land.
4. Discharge of both wash water and sludge into a settling basin, permitting the settled water to overflow into the stream and emptying the sludge into the stream at periods of high water.
5. Discharge of wash water directly into the stream and sludge into a lagoon or sludge beds.
6. Direct discharge of both wash water and sludge into lagoons which overflow to the stream.
7. Pumping of all wastes back into the reservoir.
8. Discharge of wash water and sludge into a settling basin and pumping of the settled water back to the plant, the sludge to be disposed of either in lagoons, on sludge beds or by dewatering in vacuum filters.

These methods can be varied or combined. It should be repeated that difficulties have been reported with odors from sludge in lagoons or sludge beds (1).

Experience With Settling Basin

The recent experience of the author with a method of disposal of wash water and sludge at the Willis School

plant in the Washington Suburban Sanitary District may be of interest.

A 10-mgd. conventional rapid sand filter plant of the Morse type, taking water from the Patuxent River, is located on a high ridge near the upper end of a small tributary, about 2 miles from the main stream. The tributary has a total watershed area of approximately 2 square miles. The plant uses alum as the principal coagulant, and the raw water is treated with chlorine. It was realized that the small stream would be inadequate to receive the discharge from the plant and that some method of regulating the flow of wash water and sludge discharges would have to be devised. Lagooning and discharging into other watercourses were investigated and found to be impracticable. Sedimentation tests were made on the filter wash water, as well as computations on probable sludge volumes. It was finally decided to construct a settling basin to collect all filter plant wastes—except sewage, of course—with a one-hour detention period above an estimated storage space for four months' sludge. A take-off weir was planned to regulate the flow of settled water into the stream at as near a constant rate as possible. Sludge was to be released at periods of high water in the stream, and discharge rights were acquired from all the property owners along its course.

The amount of sludge which could be expected was not easily ascertainable, but from information secured at the Montebello Filters in Baltimore, Md., a determination of the probable capacity was made, together with an allowance for wash water sludge. Since July 1944 this settling basin has been functioning. Significant data were not yet available in 1947, but records are being kept which, it is hoped, will prove valuable in time. It may be said that the sludge collected has exceeded the amount on which the design was based. With this possibility in mind, provision was made for the location and design of another basin, but its construction has not proved necessary.

Legal Difficulties

When the settling basin had been operating for a year, the town of Laurel, located on the Patuxent River below the confluence of the two streams, brought suit to enjoin its use. It was asserted that the discharge of wash water and sludge from the filtration plant would result in "the deposit of injurious bacteria and organic matter on the town's property," and that it would cause the water of the Patuxent River "to be impregnated with injurious ingredients and substances whereby the water of the river will become offensive to taste and smell and become polluted—thereby causing the river to give off nauseating and obnoxious odors." It was further charged that unless the commission was restrained the town would be compelled to abandon its plan to use the river as a source of water supply, the intake for which was to be located below the junction of the Patuxent River with the stream receiving the wastes.

The court ruled in favor of the Washington Suburban Sanitary Commission, stating: "There is not a bit of evidence in the case conclusively showing that the sludge as deposited on the stream banks has caused, or is likely to cause, illness to the inhabitants of the town. Likewise there is no evidence indicating that property values in the vicinity have been, or are likely to be, adversely affected." The court added that the effect of the discharge on the town's proposed water supply could be averted at a trivial

cost by placing the dam a few hundred feet further upstream above the confluence of the streams.

Conclusions

The author has purposely avoided attempting to give any specific data because of the sparsity of information on this subject and his lack of opportunity to assemble figures that would be of real value. It is obvious, however, that there is a great need for further investigation, and filtration engineers can contribute materially to the solution of what undoubtedly is becoming a troublesome question.

For the proper determination of the requirements for treating purification wastes, it is highly desirable that their essential characteristics be known. Are they considered as pollutants? Is the return to the stream of the same amount of sediment as previously removed, but at a greater concentration and in a shorter period of time, introducing material which is likely to create a nuisance or a menace to health or to be in any other way objectionable? Answers to these questions, of course, depend upon such local conditions as the size and use of the stream and the method of treatment employed.

Pre-chlorination should decrease the bacterial content of the wash water and thus reduce the possibility of pollution. Treatment with color-producing chemicals may cause objectionable discoloration, particularly in small streams. Unless discharged under controlled conditions, sludge may result in the formation of deposits and the silting of ponds.

A great deal of information is required to help design structures if treatment is found necessary. Data must be obtained on the sedimentation period needed for proper clarification before settled water is discharged into the stream; on the volume, weight, water content and chemical characteristics of the sludge; and on the correlation of discharge periods with stream flows. A plant must be designed that will be both economical and efficient. It should be a part of the work of Committee W-8 to attempt to secure the co-operation of purification plant engineers in assembling more data on the entire subject of waste disposal.

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Erosion Control in Los Angeles Watersheds

By Burton S. Grant

A paper presented on July 24, 1947, at the Annual Conference, San Francisco, by Burton S. Grant, Asst. Chief Engr. of Water Works, Dept. of Water and Power, Los Angeles.

THE problem of soil erosion in the watersheds of the Los Angeles water supply system is largely one of prevention of damage rather than control of erosion. The tremendous expanse of the Los Angeles system brings it in contact with watersheds varying in area from only a few acres to several thousand square miles.

The last extension to the system tapped the watershed approximately 350 miles from the city in what is known as Mono Basin. The streams in this basin are diverted above Mono Lake, a saline body of water having no outlet. They emanate from the Sierra Nevadas on the west side of the watershed, where the mountains are granitic in character and fairly heavily wooded.

These streams are diverted at an elevation of 7,000 ft., above which erosion has produced pronounced mountain disintegration as evidenced by numerous large talus structures. At the higher elevations the streams carry erosion debris along the bedrock channels. Lower down there are a number of glacial moraines which are generally stable and do not contribute materially to the stream bed load.

Erosion control in this watershed is not economically practicable compared to the cost of preventing damage through other means. The construction of devices to reject the bed load in the diverted streams has proved relatively inexpensive and entirely satisfactory.

A storage reservoir which forms an integral part of the aqueduct extension receives the direct flow of Rush Creek, the largest of the Mono Basin streams. The reservoir capacity was enlarged in 1941 from 10,000 to 48,000 acre-ft. Measurements of the amount of silting have not been made, because of the meager proportion of erosion material carried by these clear mountain streams.

Owens Valley Watershed

Owens Valley, to the south of Mono Basin, is the original source of supply for the Los Angeles Aqueduct and has a drainage area in excess of 3,000 square miles. The myriad streams forming the Owens River likewise rise in the Sierra Nevadas on the west, but the mountains in this section, though granitic, are less heavily wooded. The Owens Valley area is subject to cloudburst conditions, hence the large alluvial cones at the base of the mountains. Some of these detrital cones have a maximum elevation of 2,000 ft. above the river or the aqueduct, and they are connected with each other to make an almost continuous slope (1).

The streams emanating from the snow fields high in the mountains follow bedrock channels carrying talus debris and have a tendency to meander before they reach the Owens River or the aqueduct. Erosion control, therefore, would be practically impossible and economically unsound. Only during peak flow stages can these streams be called roily. At such times, erosion control would have to be of proportions adequate to cope with devastating cloudburst conditions.

In this part of the water system it has been found most economical to remove the bed load from the water carrier, but some desilting structures have been erected on the smaller tributaries to the aqueduct. This portion of the aqueduct terminates at Haiwee Reservoir at the south end of Owens Valley. No measurements have been taken of the silting in the reservoir, which has almost no drainage area above it, so that the amount of silt carried into it by the aqueduct since 1913 has been negligible. Silt and sand are trapped at several points along the 60 miles of open aqueduct above the reservoir. The 37-mile concrete-lined section traverses many of the alluvial cones. Overhead crossings or spillways have been constructed in natural ravines to carry cloudburst erosion across the aqueduct. These structures have prevented many thousand yards of debris from being lodged in the canal. By and large, except under cloudburst conditions, it is doubtful whether erosion by streams and rainfall would exceed a rate of 1 cu.yd. per square mile per year in the Owens Valley and Mono Basin areas.

The principal problem created by natural erosion in these watersheds and throughout the nearly 200 miles of aqueduct from Haiwee Reservoir to the city is the adequate protection of the structures crossing flood channels. The strength of the structure and the depth of the footings supporting it are the critical factors involved when dealing with both aggrading and degrading tendencies.

Dry Canyon Reservoir

The most severe reservoir silting difficulties are encountered at Dry Canyon, a small regulating reservoir below the major power drops on the Los Angeles Aqueduct near the Santa Clara River. This reservoir had an original capacity of 750 acre-ft., and all aqueduct water flows through it at a mean annual discharge of 440 cfs. The watershed above Dry Canyon, an area of 4.3 square miles, is composed of sedimentary formations with relatively steep slopes. Rainfall intensities are occasionally very high, producing runoffs in recent years of approximately 0.3 cfs. per acre.

Measurements of the silting quantities made in 1941 indicate that the capacity had been reduced 16.71 acre-ft., representing approximately 27,000 cu.yd. of water-borne material. Because of turbidity control requirements, a considerable portion of this material has been dredged from the upper end of the reservoir and deposited beyond the reach of future floods. As the aqueduct water is emptied into the reservoir at the upper end, the silt deposited by the intermittent runoff would be picked up by the aqueduct water flowing into the lake, thereby causing continued turbidity above tolerable limits.

Erosion Control Projects

In the vicinity of the city, several storage reservoirs are located in the San Gabriel and the Santa Monica

range of mountains. The department does not store and use runoff from these mountains and therefore has not participated in the problem of controlling the intensive erosion. During flood years, such as 1938, erosion exceeded 50,000 cu.yd. per square mile in some sections of the San Gabriel range (2).

This problem is being studied by the U.S. Forest Service, the Soil Conservation Service, the War Department and the Los Angeles County Flood Control District. In 1941 the Secretary of Agriculture approved a program for runoff and water flow retardation and for soil erosion prevention in aid of flood control on the watershed of the Los Angeles River, as set up in House Document No. 426 of the 77th Congress, 1st Session. This program provided for fire control; debris basins; cover, road, mountain and minor channel improvement; and farm land improvement and treatment at an estimated cost of $8,379,635. State and local governments, as well as farmers and other persons, were to participate to the extent of an additional $3,036,534.

Because of the war, the federal funds were not made available from 1942 to 1945, and the program, therefore, was greatly curtailed, permitting only partial progress in fire control; cover, road and channel improvement; and debris basin construction. Studies of the economies and benefits of erosion control were made, however, and it is understood that some further work may be authorized in the Arroyo Seco. No report has yet been published on the results of the investigations.

Debris Basins

Between 1934 and 1937 sixteen debris basins were constructed by the Los Angeles County Flood Control Dist. and the U.S. Engineers in the vicinity of Los Angeles (2). During the flood of 1938 these basins held back approximately 690,000 cu.yd. of material.

Although Los Angeles has title to and uses the Los Angeles River water, it is taken from wells and galleries, so that erosion in its watershed is not a serious problem. The reservoirs located close to the city for the storage and regulation of imported water are, however, affected by erosion and storms, and the department has found it most economical to protect the reservoirs by building storm water barriers or channels around them.

The earliest such activity involved the construction of reinforced concrete walls around the Silver Lake, Hollywood and Franklin Canyon Reservoirs. More recently extensive flood control channels and debris basins have been dug around the San Fernando Reservoirs, which receive the water from the aqueduct from Inyo County. This treatment solves quite economically the problem of silt control as well as that of pollution factors in reservoir watersheds. The element of sanitary control is of great importance in these reservoirs, for chlorination is the only treatment employed between the reservoirs and the area of use, which is close by.

In considering the use of channels for silting control, especially at existing reservoirs that have changed the natural stream and flood conditions in the watershed, certain possible legal complications should be studied thoroughly. Unless a reservoir is completely abandoned, California law may enjoin, or give damages for, the discontinuance of flood protection to property owners below the reservoir

once it has been constructed and operated for a period of time in such a manner as to reduce the effect of floods. It is believed that this doctrine is generally accepted by the courts in most states.

If the owner of an existing reservoir is contemplating the elimination of the effect of watershed erosion by the use of by-passing channels or conduits, he should not only have the assurance that full use of such facilities will be condoned by lower land owners, but should thoroughly investigate the action of the flood waters below the reservoir. All rights that might be infringed should be satisfied as a part of the project. Quite often the cooperation of flood control agencies can be obtained where the community as a whole will benefit.

Future planning by the Los Angeles Dept. of Water and Power will no doubt include storm water by-pass facilities constructed around new reservoirs in order to overcome the legal problems involved where artificial conditions might be created.

At one reservoir in the Los Angeles water system, studies are in progress to ascertain the most economical method of reducing the effect of watershed erosion. The reservoir has been used for more than 25 years without storm water by-pass facilities. The watershed not only does not contribute to the water supply of the city, but produces debris-laden floods of large proportions on occasion. Tunnels are used to bring municipal water into the upper end of the reservoir and to take it out from the lower end. Thorough consideration is being given to the cost of a closed by-pass around the reservoir for the municipal water, which would be used whenever flood water reaches the reservoir or whenever it is being emptied for cleaning and maintenance. Comparison with the cost of acquiring the necessary rights below the reservoir, to allow the natural flow of flood water to pass the dam, may show that the continued use of the reservoir to regulate floods and the occasional dredging and removal of erosion materials will be more economical.

Erosion control through the use of debris basins and flood control reservoirs has given rise to a new problem in watersheds which produce domestic water for communities. In recent years a southern California community has lost a portion of its water supply because of the creation of carbon dioxide in a debris basin constructed as a flood control facility. The water is not usable unless it is treated at extra cost.

The San Gabriel Mountains, from which the Los Angeles and other rivers forming the water supply of the coastal basin in southern California emanate, are covered with chaparral and, being frequented by the public, are subject to numerous brush fires. The denuding of portions of the watersheds by fires is followed at times by intense rainfall with resultant heavy erosion. Large quantities of organic materials are either swept toward the ocean by the flood waters or lodge in the debris basins and flood control reservoirs. In subsequent storms, layers of silt and gravelly materials are usually superimposed over the organic deposits and in a short time carbon dioxide gas is formed. The flood control basin of the community mentioned has adjacent galleries and deep wells, so that adverse effects are felt almost immediately.

This does not prove, however, that any great danger is presented to water-

sheds which capture their supplies at more remote locations. Nevertheless, it does present a problem which should be given considerable study in deciding on a program of erosion control.

Where debris basins are constructed in brush-covered watersheds, the formation of carbon dioxide may occur unless removal of the debris, by sluicing or other means, can be effected.

Construction in Undeveloped Areas

Water supply utilities will do well to use greater foresight in planning future works, especially reservoirs, in order to avoid large expenditures after the supply is damaged or the property of others affected in combating watershed erosion.

Although it may sometimes appear that the watershed above a reservoir site in essentially virgin terrain will never produce sufficient erosion and pollution to justify a by-pass channel around the reservoir, the utility may find itself in later years with a very expensive problem to correct.

If a reservoir watershed is likely to become a residential community, as frequently occurs in California, it will very probably be most economical in the end to provide for complete silting and storm protection at the reservoir as a part of the initial project, or, if it is not too large or expensive, to acquire the tributary watershed. Such measures may be advisable even when the natural contours would provide a reservoir of very irregular high water line and thus make by-pass facilities costly.

Los Angeles has experienced this problem in the Hollywood and Santa Monica Hills. Reservoirs naturally precede the development of the community and are usually located in virgin canyons. Since this territory is all privately owned, it eventually attracts home seekers, and development both above and below the reservoir starts unless the utility has acquired the entire watershed.

Streets and other works involving much cutting and filling are constructed on the sides of the watershed above the reservoir, causing increased erosion and expediting its runoff. Canyons below the reservoir are filled and leveled and occupied by walls, streets and structures, thereby restricting the passage of natural flood waters.

The increased erosion and pollution caused by more dense habitation above the reservoir may force the utility to construct a by-pass around its reservoir, with no place to dispose of the runoff unless an outfall storm drain is also built through the front yards of expensive canyon homes. Undoubtedly the debris dam solution would be too late at this stage of the development because of rising property values, as well as for esthetic reasons.

Careful thought should be given to the economics of the new reservoir project under such circumstances. Perhaps the acquisition of the entire watershed would be cheapest in the long run.

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Erosion Control in East Bay Watersheds

By Francis B. Blanchard

A paper presented on July 24, 1947, at the Annual Conference, San Francisco, by Francis B. Blanchard, Sr. Hydraulic Engr., East Bay Municipal Utility Dist., Oakland, Calif.

THE East Bay Municipal Utility District derives its water supply, which serves a community of some 900,000 people, from two principal sources. The chief source is the Mokelumne River in the Sierra Nevada, where the Pardee Reservoir, with 210,000 acre-ft. of storage, is located. At present more than 90 per cent of the entire water supply is brought to the district from this source by means of a 93-mile aqueduct. The other source consists of streams in the coast range, located near Oakland, Calif., on the east side of San Francisco Bay within the area served by the district. There are four reservoirs on these local watersheds.

The district is concerned with erosion on all of its watersheds because of the slow but steady loss of storage due to sedimentation of the reservoirs. Surveys of the capacity of these reservoirs have been made at intervals over the years, with the results shown in Table 1.

The oldest reservoir still in operation is Chabot Reservoir on San Leandro Creek, constructed in 1875. Its original capacity of 15,860 acre-ft. was reduced by silt deposits to 12,224 acre-ft. by 1942, a loss of 23 per cent in 67 years. The annual rate of silting has averaged 54 acre-ft. per year. Since 1924, the rate of silting as well as the drainage area has been materially diminished by the construction of Upper San Leandro Reservoir upstream on the same watershed. The total runoff from 1923 to 1942 includes 138,740 acre-ft. released from the upper reservoir.

Upper San Leandro Reservoir has lost 976 of its original capacity of 41,398 acre-ft. up to 1941, representing a loss of 2.4 per cent in 17 years. The annual rate of silting has averaged 57 acre-ft. per year, which is very nearly the same as the 67-year average at Chabot Reservoir. In fact, the stability of erosion conditions on the entire San Leandro Creek watershed is indicated by the successive measurements of the capacity of its two reservoirs. It should be noted that the 1935 survey of Upper San Leandro, made by the U.S. Dept. of Agriculture, employed the contour method. The results may be somewhat in error because the range method was not used on rugged topography, although the silting rate agrees with that at Chabot for comparable periods.

San Pablo Reservoir, constructed in 1917, has lost 1,809 of its original capacity of 43,149 acre-ft. up to 1943, or 4.2 per cent in 26 years. The annual rate of silting has averaged 65 acre-ft. The silt deposit was measured at 1,133 acre-ft. in 1938, and the 1936 figure

was arrived at by estimating the rate as 1.6 times that of San Leandro Creek for an equal discharge. Highway construction and land subdivision after 1936 caused erosion to accelerate, but control projects since completed have returned the rate to normal. The 1943 total of silt deposit does not include ume of eroded material per acre of watershed is comparatively large. The average rate of eroded material per acre per year is 88 cu.ft. for Chabot Reservoir, 128 for Upper San Leandro, and 137 for San Pablo Reservoir. These quantities, of course, are volumes based on the relatively low den-

TABLE 1

Silt Deposition in East Bay Reservoirs

Year of Survey	Interval *yr.*	Capacity at Open Channel Spillway		Silt Deposit in Reservoir *acre-ft.*	Total Runoff Since Previous Survey *acre-ft.*	Mean Annual Runoff Since Previous Survey *acre-ft.*	Annual Rate of Silting			Drainage Area *sq. miles*
		mil. gal.	*acre-ft.*				Mean *acre-ft.*	Silt per Acre of Drain Area *cu. ft.*	Portion of Total Runoff %	
Chabot Reservoir										
1875		5,169	15,860							42.05
1900	25	4,675	14,350	1,510	470,300	18,800	60.4	98	0.32	42.05
1910	10	4,250	13,040	1,310	220,770	22,100	131.0	212	0.59	42.05
1923	13	4,090.5	12,553	487	214,700	16,500	37.5	61	0.23	42.05
1942	19	3,983	12,224	329	185,340	9,750	17.3	100	0.18	11.75
Upper San Leandro Reservoir										
1924		13,490	41,398							30.3
1935	11	13,434	41,228	170	90,200	8,200	15.4	34.5	0.19	30.3
1941	6	13,171	40,422	806	139,430	23,200	134.3	302	0.58	30.3
San Pablo Reservoir										
1917		14,068	43,166							
1936	19	13,938	42,773	376	137,960	7,260	12.4	26.1	0.27	32.2
1938	2	13,691	42,016	757	47,210	23,600	378.5	820	1.60	32.2
1943	5	13,510	41,461	555	99,280	19,856	111.0	234	0.56	32.2

approximately 50 acre-ft. impounded above erosion control dams constructed in 1939–40.

The fourth local reservoir of the district, Lafayette, is located on a very small watershed and has not been surveyed for loss in storage since its construction in 1928.

Although the annual rate of silting of the reservoirs is moderate, the volsity of deposited material in the reservoirs, not volumes in place on the watershed.

The Mokelumne River, on which Pardee Reservoir is located, is primarily a snow-fed stream and drains a mountainous watershed where there is comparatively little erosion at the present time. The life of this reservoir, calculated by dividing its capacity

by the annual quantity of silt deposit, is estimated to be more than 2,000 years. Unless the present rate of erosion is accelerated by logging operations, which have increased in the last few years, there seems to be little cause for immediate concern over the loss of storage in Pardee Reservoir. Constant vigilance will be necessary, however, as the use of the watershed lands increases.

The chief erosion problem of the district, therefore, exists on its local watersheds. These are utilized not only for the water supply they yield, but also to re-regulate the inflow from distant Pardee Reservoir and, most important of all, to provide stand-by storage if there should be a major break of long duration in the 93-mile aqueduct from Pardee Reservoir. Any loss of storage due to sedimentation of the local reservoirs will inevitably aggravate problems of operation.

In its watershed erosion control program the district has enjoyed the benefit of the experience gained by the Soil Conservation Service in similar work. Prior to the war a co-operative agreement was worked out with the service covering investigations, the design of erosion control facilities, the study of range management and an extensive planting program involving about 86 square miles of watershed. Advice and suggestions by personnel of the California Forest and Range Experiment Station have also proved valuable.

Erosion Control Structures

Between 1939 and 1942 the district constructed, with the aid of WPA labor, a number of erosion control structures of various types, principally on the San Pablo Creek watershed where conditions are relatively severe. The war interrupted this program, but sufficient results were achieved to improve the worst areas, to provide a yardstick of effectiveness and to guide future planning.

Sites for these structures were selected on the basis of the most difficult gullying conditions, as determined from field inspections and air photographs. The purpose of each structure is to stabilize the profile of a channel to permit the growth of vegetation which will hold the soil in place.

TABLE 2

San Pablo Watershed Erosion Control Structures

Type of Structure	Number
Road culvert with riser	9
Missouri dam and outlet structure	20
Rubble masonry drop structure	20
Road culvert with transition inlet and outfall apron*	37
Dry rock check dam	2
Reinforced concrete overfall dam	1
Deflector jetties	3
San Dimas type measuring flume	1
Outlet chute	1
Wooden grill inlet	2
Earthen dike	2
Sack concrete wall	2
Embankment protector	4
Concrete retaining wall	1
TOTAL STRUCTURES	105

* Located on Wildcat Creek Road.

Up to the present time the district has built a total of 105 separate erosion control structures on the San Pablo Creek watershed, as listed in Table 2. There are 20 Missouri type dams with drop inlets; 20 rubble-masonry check dams; one reinforced concrete overfall dam; 46 road culvert structures, some with risers and some with transition inlets and outfall aprons; and 18 other structures of miscellaneous types. Seven other minor structures are located on the Chabot watershed.

The Missouri type dams consist of an earth fill across the gully or channel, covering a corrugated metal pipe culvert with a vertical riser on the upstream end to provide a silting basin above the dam. A trash rack is placed upon the top of the vertical riser to prevent clogging and also to eliminate the vortex action of the water when the pipe is discharging under a maximum head. This idea originated with the Soil Conservation Service, but the design has been slightly modified by the district to conform to local needs.

The drop structures for gully control are of the type developed by the Soil Conservation Service following laboratory tests at the California Institute of Technology. They are constructed of rubble masonry and have a stilling basin at the foot of the drop to prevent scour at that point. In some cases prevention of scour is assisted by longitudinal sills in the stilling basin, which suppress the lateral movement of the water at the base of the fall.

All of the dams and drop structures trap an appreciable amount of silt and other debris above them, thereby relieving the reservoir sedimentation to some extent. It is estimated that 50 acre-ft. of debris has been trapped behind the structures now built in the San Pablo watershed. The capture of this volume of debris is not the purpose of the structures, however, since it would be more economical to construct additional storage at the main reservoir. They exist primarily to stabilize the stream profile, to prevent further cutting-down of the channels and to facilitate the growth of soil-holding vegetation.

Turbidity Observations

In order to assist in selecting the best location for future erosion control structures and to determine where the most severe erosion originates, an attempt has been made to classify portions of the watersheds on the basis of the relative turbidity of the streams which drain them. On rainy days throughout the runoff season, mobile crews are sent out into the watersheds to obtain samples at some 20 sediment sampling stations on the tributary streams. Samples are taken with a Topock sampler about every 2 hours at 60 per cent of the depth in midstream; as soon as one round of sampling is completed, another is begun. Various standard methods of determining the sediment concentration in parts per million are used, depending on the turbidity of each sample.

Since only comparative results were desired, analysis of the data was limited to averaging the turbidities for the season at each station, using only observations which were part of a complete sampling round. Seasonal suspended sediment load cannot be determined by this method, which is purely relative. The results are shown in Tables 3 and 4 for the three years from 1943–44 to 1945–46.

When the stations are arranged in their relative order of average turbidity, it is noted that there is some consistency in results, but otherwise a station which was the least turbid in one season is found to be the most turbid in another season. At some stations (San Leandro Creek Sta. 3 and 4) this extreme variation can be explained by control measures taken between seasons, but on the whole the results appear erratic and no satisfactory explanation has been offered. It may be that the changes are related to the wetness of the season, the local variation in rainfall and the intermittent character of the erosive process in gullying streams. The average tur-

bidities do not vary greatly from station to station, and this fact contributes to the difficulty of the analysis, since minor sampling errors may play a part.

It is concluded that further work on this method of rating the different drainage basins must be done before turbidity can be considered a reliable index to the relative severity of erosion in the district's local watersheds.

TABLE 3

Turbidity Comparison at San Pablo and San Leandro Creek Sediment Sampling Stations

Sta. No.	Area of Basin *acres*	Avg. Turbidity *ppm.*			3-Yr. Avg. *ppm.*	Stations Arranged in Ascending Order of Avg. Turbidity			3-Yr. Avg.
		1943–4	1944–5	1945–6		1943–4	1944–5	1945–6	
San Pablo Creek									
1	231	1,480	1,230	2,149	1,620	7	6	11	6
2	1,795	954	932	1,268	1,051	9	2	2A	7
2A	1,564	1,123	1,087	1,150	1,120	6	2A	7	2
3	270	4,570	5,280	6,410	5,420	5	1	2	2A
4	4,241	1,097	2,045	1,640	1,594	2	10	9	10
5	346	909	1,432	2,097	1,479	8	7	6	8
6	1,155	839	847	1,455	1,047	10	8	10	5
7	388	596	1,350	1,212	1,053	4	5	4	9
8	1,706	955	1,390	1,681	1,342	2A	4	8	4
9	7,852	801	2,610	1,372	1,594	1	9	5	1
10	8,512	975	1,260	1,593	1,276	11	11	1	11
11	4,409	1,548	3,670	1,140	2,119	3	3	3	3
No. of Samples		32	28	32					
San Leandro Creek									
1	658	376	5,430	1,029	2,278	2	4	5	5
2	320	234	3,310	1,266	1,603	1	5	4	3
3	386	1,377	2,430	740	1,516	5	3	3	2
4	198	2,645	1,905	592	1,714	3	2	1	4
5	2,544	588	2,429	499	1,172	4	1	2	1
No. of Samples		39	21	39					

Forestation

The watershed lands in their natural state consist very largely of bare grassland with trees and brush growing in protected locations, especially on the north and east slopes where soil and moisture conditions are favorable. The grassland and brush are extremely subject to "flash" fires, which burn very quickly and aggravate erosion in the succeeding runoff seasons.

To prevent this type of damage, an extensive tree-planting program is necessary. This work began about 40 years ago and is responsible for over 400,000 planted trees which are now

surviving. Much of the early planting was in types of eucalyptus, but these trees have proved unsatisfactory for watershed plantings because of the lack of ground cover beneath them. The best tree for this purpose has been found to be the Monterey pine (*Pinus radiata*). During the current year it is planned to use about 35,000 trees, mostly Monterey pine, as test plantings, and thereafter the number will be increased until ultimately a minimum of 100,000 trees per year is reached.

More important than the number of trees set out, however, is the number that survive. In the past the survival rate has not always been satisfactory for a number of reasons: the girdling of trees by rodents, the lack of water to carry trees through the first season and the browsing of young trees by stock. These conditions are now being corrected. Rodents are being controlled by the spreading of poisoned grain throughout the planted areas at least twice a year. Provision has been made to supply water to the young trees to carry them through the first summer after planting.

TABLE 4

Percentage of Normal Runoff

Watershed	1943–44	1944–45	1945–46
San Pablo Reservoir	70	116	83
Chabot Reservoir (San Leandro Creek)	55	99	84

A permanent forestry and watershed maintenance force of 21 men has now been established. Past experience very definitely indicates that continuous care must be given to the propagation and maintenance of young trees. By a system of work rotation it is possible to carry on a continuous year-round program of watershed care, suiting the type of work done to the season and the weather. Trees are planted on clear days in the wet season; on rainy days there is plant propagation and potting to be done. Clearing of brush around young trees, removal of dead trees, tree watering, construction of firebreaks and erosion control structures and reconstruction of fences—all phases of the same program—are carried on in the dry season. Since this is also the fire season, the crews on the watershed are able and equipped to respond to fire calls. All of this can be done by the permanent forestry and watershed maintenance force, thereby insuring a continuity of effort.

Since fire-fighting is so necessary a part of erosion control, mention should be made of the new equipment now in use. Jeeps fitted with a small water tank and pump and equipped with radio (a few have two-way communication) accompany each watershed maintenance crew. This permits an unusually quick response to fire calls as all crews can be summoned from their maintenance work in an emergency and directed to the location of the fire.

Prevention of Damage

Large portions of the district's local watersheds are in private hands, and because they are highly desirable for residential development, are rapidly being subdivided and built up with consequent disturbance to the soil. Moreover, important highways traverse other sections of the watersheds. These developments give rise to erosion control problems which cannot be handled by any set program, but which require constant vigilance to detect incipient erosion. It has occasionally been possible to work out agreements with pri-

vate owners or public agencies for initiating the necessary control measures, but it is not possible as yet to announce a complete solution.

In the Mokelumne watershed, which is traversed by the main Sierra Nevada forest belt, there has been a revival of lumbering in the past few years. Although most cutting is controlled by the Forest Service, the lumbering operations require the construction of many miles of roads through steep, easily disturbed forest soil to reach inaccessible places. This presents an additional problem which it will probably be increasingly necessary to cope with over the succeeding years. Mining on the Mokelumne watershed is another activity which has caused excessive silt depositing in the past, but it has not been severe recently.

Wide areas of the local watersheds are suitable for grazing, which is beneficial in reducing the fire hazard present in stands of dry grass. It is now believed that grazing requires much more strict control than it has hitherto been given, and measures are being taken to prevent overgrazing the trampling of small meadows and the browsing of young trees. Conditions are watched closely and operators are required to keep stock away from damaged areas. Although the cultivation of certain areas has been permitted in the past, beginning in 1947 no cultivation will be allowed on district-owned watershed land because of the difficulty experienced in assuring that tenants follow prescribed crop practices.

Appraisal of Control Program

It is fitting that from time to time the district engineers determine what benefits are to be expected from the erosion control program that has been set up and whether the expenditures to be made will justify themselves. If it were possible, a complete economic analysis would be very desirable. Unfortunately, however, the present state of knowledge does not permit it. All that can be done at this time is to list the prospective benefits and other factors involved and to appraise them in broad terms.

The most obvious benefit expected is the reduction in the silting rate of the reservoirs. Under prevailing conditions the district is losing an average of approximately 140 acre-ft. of storage per year in its local reservoirs on account of sedimentation. The cost of replacing this storage is variable, but estimates average about $84 per acre-ft. at present prices for a large project. Thus sedimentation alone may be said to cost roughly $12,000 a year, but this is not a valid criterion of the worth of erosion control. If there were no control and if the watersheds were neglected and allowed to deteriorate, the sedimentation rate might easily increase several times.

Another prospective benefit may be derived from the sale of timber from the forested watersheds. The Monterey pine stands grow rapidly and are expected to be of marketable size in 20 to 30 years. Since the natural propagation of this tree is vigorous, there is no replanting problem and therefore no objection to selective cutting in mature stands. Until experience is gained in this field, however, it would be premature to attempt an evalution in dollar terms.

A further benefit may be the reduction in the chemical cost of filtration of the reservoir waters, as erosion control measures reduce the turbidity of the raw water. All of the district's water supplies are filtered. Past ex-

perience has shown that alum and lime dosages must be increased greatly during the wet season, when the streams are pouring large volumes of silt into the reservoirs. Since the relation between chemical dosage and turbidity is not an exact one, however, the evaluation of this factor is difficult. All that can be said is that a potential benefit—and a large one—exists.

Among other factors to be considered is that, from a long-range point of view, the district is still in the development stage as far as techniques of forestation—and even of locating and building erosion control structures—are concerned. Methods are constantly being improved as studies continue and experience is gained from results under local conditions. This process can be expected to continue for some time.

Although the erosion control and forestation program of the East Bay Municipal Utility District is in its initial phase, sufficient results have been achieved to indicate that benefits commensurate with outlay may reasonably be expected from reductions in reservoir sedimentation and filtration costs and perhaps from the sale of timber. Furthermore, as custodian of the watersheds, the district will have the added satisfaction of turning over to the succeeding generations lands which have not deteriorated and which may in some respects be in even better condition than when they were received.

De-chlorination at the Washington Aqueduct

By Carl J. Lauter

A paper presented on July 22, 1947, at the Annual Conference, San Francisco, by Carl J. Lauter, Sr. Chem. Engr., Washington Aqueduct Water Supply System, Washington District (D.C.), Corps of Engrs.

AT the Washington Aqueduct, super-chlorination and de-chlorination treatment was first applied on a large scale in the Dalecarlia rapid sand plant about two years ago. The Washington Aqueduct, which is the supply division of the water system for the national capital, is operated under the control of the War Dept. It includes the McMillan slow sand filter plant with 29 one-acre filters having a present nominal capacity of about 100 mgd. This plant was put into use in 1905 and supplied the city until 1928. At that time the Dalecarlia rapid sand filter plant, with 20 filters and a present nominal capacity of about 85 mgd., was completed and placed in use to meet the increasing demands for water. The distribution of water in the District of Columbia is effected by the Water Division, D.C., of the municipal government.

Although this paper treats of super- and de-chlorination experiences at the Dalecarlia filter plant, it may be of interest to note that sterilization with chlorine was introduced into the Washington Aqueduct system in 1923, five years prior to the completion of the Dalecarlia plant.

During the early years of operation of the Dalecarlia filter plant, post-chlorination alone was practiced by applying the chlorine to the water at a point after filtration, just prior to its entry into the clear water basin. Residuals in the water going to the city were maintained at 0.25 to 0.30 ppm.

In January 1930 pre-chlorination was initiated by applying the chlorine to the water at a point between the sedimentation basins and the filters. Following a period of taste and odor troubles in June 1933, anhydrous ammonia was added to the pre-chlorination dose. Post-sterilization was continued by the use of chlorine alone to assure the desired residual to the city.

In 1940 aqua ammonia, in a 15 per cent solution, was substituted for the more costly anhydrous ammonia, and chloramine was used at both points of application. Residuals were stepped up, and there was a noticeable improvement in the character of the water supply throughout the distribution system. Bacterial counts went down to an average of about 3 per ml., and complaints of taste and odor decreased considerably.

Prior to 1946, numerous chlorine adsorption determinations had been made on the Potomac River water. In general, the rise and sudden drop in chlorine adsorption, so characteristic of many (although not all) river waters, was not found.

Gaseous Sulfur Dioxide Method

Laboratory tests were conducted in which filtered water was treated, leaving residuals varying from the usual 0.3 ppm. up to as much as 10.0 ppm. All residuals above 0.3 ppm. were considered undesirable because of tastes and odors. Even though the chlorine was in the free residual state, it was thought advisable to remove the excess over 0.3 ppm. by de-chlorination, if super-chlorination were to be successful. In January 1946, most of the water was being filtered at the McMillan slow sand plant, leaving a relatively low rate at the Dalecarlia plant, where facilities for chlorination at high dosages were available. It was therefore decided to begin super- and de-chlorination on a full scale.

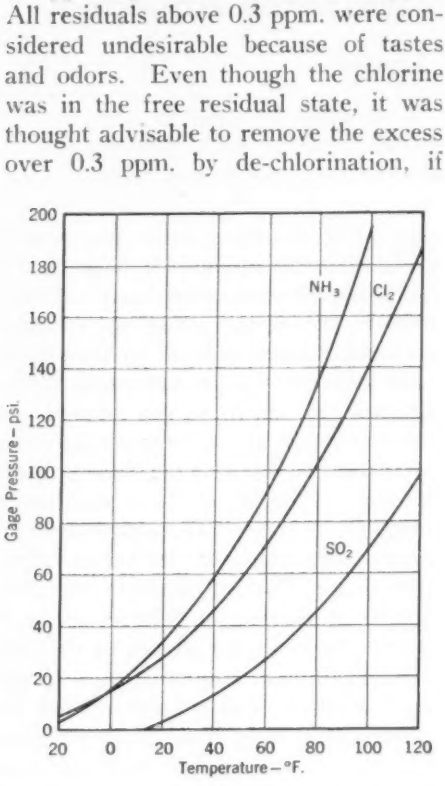

FIG. 1. Pressure-Temperature Chart for Compressed Gases

Anticipating that there would be trouble in feeding gaseous chlorine from the 2,000-lb. containers in amounts large enough to carry out the work desired, an evaporator was set up in conjunction with a 1,500-lb. chlorinator on the raw water intake at the Dalecarlia filter plant. For de-chlorination, sulfur dioxide gas was fed from 1-ton containers through rotameters. There was considerable difficulty because the containers were kept outdoors in the cold weather. The demand for the gas, coupled with the relatively low vapor pressure of sulfur dioxide, caused a drop in pressure, which at times fell to zero (Fig. 1). Following the rotameter application, the gas was fed through a regular vacuum-type chlorinator and, with the chlorine cylinders stored in a warm location, it was possible to maintain steady rates of discharge and complete utilization of the sulfur dioxide from the containers.

Sodium Metabisulfite Process

Since sulfur dioxide is also available commercially in the solid form, as sodium metabisulfite ($Na_2S_2O_5$), it was decided to give this compound a trial. The salt was received in standard 400-lb. cartons and was put into solution in wooden barrels. Sodium metabisulfite is readily soluble, and the 30 percent solution used at the Dalecarlia filter plant was easily made up. Its solubility is 54 parts in 100 parts of water at 20°C. This solution, when fed by ordinary proportioning feeders through rubber-lined pipe, gave the same results as liquefied sulfur dioxide. There is one factor to be considered, however, in using sodium metabisulfite: the high vapor pressure of the released sulfur dioxide. If fed from dry feeders, all metal work in contact with the chemical must be of stainless steel or some other anti-corrosive material that will not be attacked by the moist vapors. Solutions at the concentration employed

in the Dalecarlia filter plant also are high in sulfur dioxide vapor content and are corrosive in their reaction to ordinary steel or ferrous metals.

Commercial sodium metabisulfite has about 62 per cent available sulfur dioxide, and 1.34 parts of the bisulfite are required to remove one part of chlorine. As greater amounts of sulfur dioxide were required than were produced by the existing apparatus for feeding sodium metabisulfite, it was decided to return to the use of liquefied sulfur dioxide.

Chlorine dosages ranging from 3.5 to 4.5 ppm. have been added to the raw water entering the Dalecarlia filter plant since July 1946. The chlorine is added just prior to the introduction of the coagulant, aluminum sulfate, into the raw water conduit and is fed through an evaporator and a vacuum chlorinator. This highly treated water is then passed through the mixing and the open sedimentation basins, with a resulting contact period of 2½ to 4 hours.

Pre-filter De-chlorination

During the period from July 1946 to May 1947, de-chlorination was practiced at the Dalecarlia filter plant. The point of application of the sulfur dioxide was in the conduit connecting the sedimentation basins to the filters. This point was chosen for several reasons: a good manifold existed for the purpose; there was a good sampling point for the determination of the amounts of sulfur dioxide required; interfering lime dosages used for pH control, which have a chlorine removal factor, were absent; and an opportunity was afforded for adding a post-chlorination dose, if needed, without completely shutting off the sulfur dioxide treatment.

From Fig. 2, it will be observed that a little over 1 ppm. of chlorine was removed during the winter months. Al-

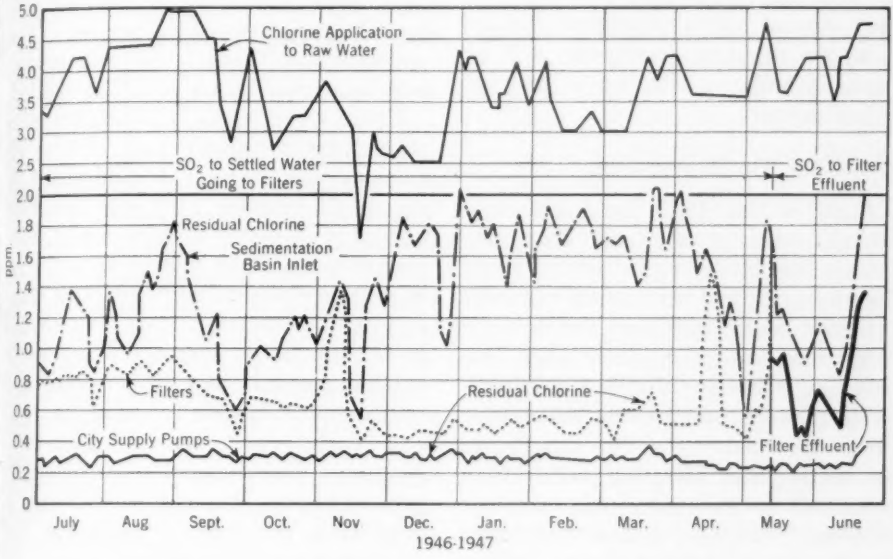

FIG. 2. Super- and De-chlorination Records at Dalecarlia Filter Plant

though theoretically 0.9 parts of sulfur dioxide will remove one part of chlorine, at the Dalecarlia filter plant the average removal was one part of chlorine by one part of sulfur dioxide.

The residuals in the water going into the filters were practically all free chlorine, as indicated by Laux flash tests. On passing through the filters, further adsorption of chlorine occurred and, because of the nitrogen compounds still present in the filters, there was an increase in the chloramine residual in the filter effluent. It is anticipated that, in time, the nitrogen compounds will be oxidized and the chloramine residual will disappear.

Post-filter De-chlorination

Early in May 1947, the de-chlorination point was changed, and the sulfur dioxide was applied to the water leaving the filters. It had been found that high residuals which persisted through the filters after de-chlorination were free chlorine, indicating that the sulfur dioxide tends to remove the chloramine first. By applying sulfur dioxide to the water after filtration rather than before, it is easier to maintain free chlorine residuals without excessive overdosages in the water going to the city.

Unfortunately, there have been periods in the month of May when high turbidities in the river water have made it impossible to obtain free chlorine residuals in the filters with the available facilities. These high demands are not frequent enough to affect the general program, and they will be taken care of by the installation of equipment with a greater feeding capacity for both chemicals. During these periods of high chlorine demand, when complete oxidation was not reached, tastes and odors tended to appear.

Results

The major beneficial results of super-chlorination with de-chlorination noted at Dalecarlia are the production of a tasteless and odorless water with low residuals and a nearly perfect bacterial efficiency. Water entering the filters is completely free of coliforms, and there is no increase of organisms in its passage through the filters. Residuals in the city are not excessive and appear ample to maintain a water free of coliform organisms, with an average 24-hour bacteria count of 2 per ml. The sedimentation basins are not septic, and algae growths are easily controlled.

Certain supplementary benefits also accrue from the greater ease with which a steady residual may be maintained by the de-chlorination of a high residual instead of adjusting the amount of chlorine to the organic content of a water. In simple chlorination there is a day-and-night adsorption ratio that makes it difficult for an operator to maintain a good residual, but it is quite easy to add sulfur dioxide to reduce any excess residuals as a result of super-chlorination. The manganese occasionally present in raw Potomac River water is completely removed by oxidation and precipitation on the filters.

In Washington, it is the practice to maintain a free chlorine residual in the water going to the city. This residual, it is believed, can be obtained by super-chlorination and oxidation of organic matter, with the proper use of sulfur dioxide as a de-chlorinating agent. Final residuals can be maintained as free chlorine or, if desired, chloramine residuals can be obtained by the addition of ammonia. Super-chlorination with de-chlorination will be continued to determine whether satisfactory results will be obtained during all seasonal changes in the raw water supply.

Super-chlorination and De-chlorination

By Norman J. Howard

A paper presented on July 22, 1947, at the Annual Conference, San Francisco, by Norman J. Howard, Director of Water Purif., Filtration Plant, Toronto, Ont.

THE super-chlorination of water involves the deliberate addition of chlorine considerably in excess of the normal requirement. The first reference to this practice appeared in 1912 in a British publication, which described the treatment of a series of wells supplying water to the Metropolitan Asylums Board. This water was subsequently de-chlorinated by the use of a solution of sodium sulfite. Further reference to the subject was made in the annual reports of the Metropolitan Water Board in 1918 and 1919, when some of the London supplies were super-chlorinated and de-chlorinated with a sulfurous acid gas solution. In 1921 Sir Alexander Houston described numerous researches carried out in the board laboratories, on this method of treatment and mentioned that de-chlorination could be effected by sulfur dioxide, sodium sulfite, bisulfite or sodium thiosulfate.

During that year the author spent nearly two months in the water board laboratories where he discussed this treatment at length with Sir Alexander Houston. It may be remembered that at this time Toronto, along with many other large cities in America, was troubled with a continuous and intensive taste and odor in the water supply following chlorination. Until then, Houston had not considered phenoloid substances as a cause of tastes and odors in chlorinated water but had attributed their presence in the London supplies to algae and other organic matter. The fact that almost all of the water super-chlorinated in London had a very short contact period would seem to indicate that no phenol was present and that the well supplies treated were organically very pure and particularly susceptible to chlorine. For this reason higher than normal doses of chlorine were used, the water being subsequently de-chlorinated. Houston afterwards carried out numerous laboratory experiments with phenol solutions to demonstrate the formation of substitution compounds in water which had passed through a Berkefeld filter.

The first reference to super- and de-chlorination treatment on this continent occurred at the 1922 Association meeting at Philadelphia, where the results of a large number of experiments made in Toronto were described. The critical doses of chlorine causing taste and odor formation in water containing phenol were reported and the corrective treatment outlined. The first actual super-chlorination dose used in the United States was made up by William W. Brush and Frank Hale in 1922 for the Kensico supply of New York City. At the time this supply had a pronounced taste and odor as the result of a *Synura* infestation. The normal dose of under 0.30 ppm. was

increased to 0.73 ppm. and the taste was rapidly brought under control. No de-chlorination was employed.

Toronto Experience

Systematic super- and de-chlorination treatment was commenced in Toronto in 1926 when an average flow of 70 mgd. was treated. In succeeding years treatment was employed at Jamaica, N.Y.; Ironton, Ohio; Rahway, N.J.; and Bay City, Mich.; but it was not until the end of 1939 that country-wide interest became centered on free residual chlorination, which must be regarded as a refinement of super-chlorination. The adoption of super-chlorination in Toronto was recommended in 1923, although it was not accepted because of the radical nature of the treatment. The situation can well be visualized, particularly by those associated with municipal administrations. It required three years to convince officials and consumers that the cure for water tastes due to chlorination was the addition of more chlorine.

Super-chlorination was introduced principally to eliminate taste and odor, but its value as a safety factor in heavily polluted waters was stressed at the outset. Early researches on tastes and odors occurring in heavily polluted Lake Ontario water following chlorination showed that the intensity of taste varied irregularly with the chlorine dosage. Taste occurred with only 0.25 ppm. of chlorine, got progressively worse up to 0.50 ppm., but improved at 0.60 ppm. As this dose was increased to 0.90 ppm., the taste became more pronounced, then improved sharply at 1.0 ppm. and finally disappeared at a dose of 1.25 ppm. Another series of samples dosed with chlorine up to 2.5 ppm. tasted foul after 30 minutes' contact. After the water was allowed to stand overnight, however, it was found to be free from taste. This accident provided the answer that had been sought for over three years, during which 3,000 experiments were conducted.

The effect of phenol in water was also investigated. The isolation of phenol from the sewage disposal effluent emanating from the local gas company led to an examination of some 25 coal-tar by-products. Five were found capable of causing taste in chlorinated water. These substances were subsequently added in dilute form to water treated with 0.25 ppm. of chlorine and the results studied. The chief offenders in the benzenoid grouping were phenol and ortho-, para- and meta-cresol. The time factor and the amount of chlorine necessary to oxidize the substances and prevent the formation of substitution compounds were also studied. From these observations a chart was developed showing the size of the dosage and the length of the contact period required for corrective treatment. According to a graph based on an actual treatment, as the dosage of chlorine was increased, the residual rose progressively up to a point at which a sharp drop occurred (1). At this point the most intensive taste developed, but as the residual began to rise again, the taste decreased rapidly and finally disappeared. Ten years later a study of this behavior by Griffin and his associates resulted in the development of free residual chlorination.

The Toronto tests of the coal-tar groups showed that, although cresols produced a more offensive taste than phenols, they required less chlorine and a shorter contact period for correction. Chlorine dosage at the start of the treatment in Toronto was raised from 0.25 to 1.25 ppm. In succeeding

years the effective dose was increased to 4.5 ppm. with a residual which at times was well under 1.0 ppm. The rapid changes in the quality of the raw water were the greatest problem, as the chlorine residuals showed a wide variation ranging between 2.5 and 0.9 ppm. Frequent changes had to be made in the dosage of the filtered water in order not to overload the de-chlorinating machines. Occasionally a slight excess of chlorine would pass into the distribution system and cause complaints, for Toronto water is very susceptible to chlorine taste. A possible, but unlikely, explanation may be that oxidation was not always complete. The suggestion has also been offered that, prior to treatment, taste conditions were so bad that consumers did not object to water containing heavy chlorine residuals. With water usually free of chloro-phenolic taste and odor, it seems illogical to carry a high residual, which may be particularly objectionable from an industrial viewpoint. It has been reported that a residual of 2.0 ppm. after treatment can be maintained without complaint. Except in rare circumstances—perhaps involving bacteriological quality—no justification exists for excessive chlorine residuals.

De-chlorination Procedure

Earlier it was stated that several reagents could be used for de-chlorination. The question would seem to narrow down to one of cost. Most of the chemicals previously mentioned, with the exception of sulfur dioxide, can be applied through standard dry-feed machines. Sulfur dioxide requires specially designed evaporators in order to maintain adequate operating pressure. In Toronto, two types of heating are employed: live steam fed directly into the bottom of the evaporator bath or standard electrical equipment. Both are thermostatically controlled at an operating temperature of approximately 190°F. This permits a gas pressure of 50 psi. to be maintained uniformly. It should be mentioned that evaporators are also used for the application of liquid chlorine, partly on account of the rapid rate of draw-off under conditions of heavy demand.

At Bay City, Mich., Harrison successfully de-chlorinated previously super-chlorinated water by passing it through beds of granular carbon, the ordinary filter units being used for this purpose. This method has been used elsewhere in this country and in Europe. Aeration is not recommended because of the release of free chlorine into the atmosphere.

Mention should be made of one operating problem encountered as a direct result of a hexachlorethane impurity in the chlorine. When present, hexachlorethane normally should deposit at the point of expansion. After leaving the evaporator the chlorine passes through a standard reducing valve and then into the manifold system. Frequent blocking of the reducing valve occurred, on one occasion after only four hours. Examination of the manifold system showed that a ¾-in. brass pipeline was plugged solidly for over 2 ft., and this obstruction had to be drilled out. Large machines of 2,000-lb. capacity often had to be completely dismantled at considerable expense. Hexachlorethane was found in crystalline form inside the machines and its insolubility made it difficult to remove. The high evaporation temperature, of course, had caused it to separate from the chlorine. Inside the bell jars, the temperature of the gas was reduced by the cold water to a point where the hexachlorethane froze

out and was deposited inside the machines. The manufacturer at first did not admit the presence of the impurity in the chlorine, but, upon being shown the deposit inside the manifolds and machines, suggested that the water in and around the bell jars be warmed sufficiently to keep the hexachlorethane in the vapor state. This meant the installation of seven electrical heating units, which, apart from the cost, were practically unobtainable at the time. A reduction in the temperature of the evaporator bath water resulted in a definite improvement. Other than the occasional freezing of the sulfonators due to faulty operation, no major operating problems have arisen.

Free Residual Chlorination

The super-chlorination treatment has led to the development of free residual chlorination, which is becoming quite widespread. Griffin has stated that the benefits of free residual chlorination include superior bacterial removal, taste and odor reduction, coagulation improvement, iron and manganese oxidation, algae control and color bleaching. Not only is the water quality in the distribution system improved by the treatment, but it also has a favorable effect on the maintenance of pipeline capacity, the inhibition of biological corrosion and the betterment of water conditions at dead ends.

Summary

1. Over a period of years it has been shown that the super-chlorination of water, with or without de-chlorination, is an effective method for the removal of most tastes and odors, and furnishes additional protection against water-borne disease.

2. De-chlorination can be effected by several chemical reagents or by filtration through granular carbon.

3. If the complete chlorine demand has been satisfied, and chlorinous tastes and odors are not objectionable, de-chlorination may be unnecessary. The possible injurious effect of free chlorine upon manufacturing processes should, however, be considered.

4. When de-chlorination is practiced, it is usually necessary to add greater amounts of sulfur dioxide than is theoretically needed to combine with the chlorine. The partial oxidation of the sulfurous acid by the dissolved oxygen in the water causes the formation of sulfuric acid, which combines with the alkalinity without affecting the free chlorine. Overdosing with sulfur dioxide is wasteful and undesirable as it may encourage the growth of certain bacteria.

5. Super- and de-chlorination of a normally alkaline water results in a slight increase in calcium chloride and calcium sulfate hardness, and a decrease in carbonate hardness.

6. For super- and de-chlorination, the water under treatment must be sufficiently high in alkalinity to prevent the formation of sulfuric and hydrochloric acid. The treatment cannot be employed on an acid water.

7. Careful laboratory control is essential for effective prevention of tastes and odors.

8. Chlorine must be used in sufficient quantities or taste and odor conditions will not improve and may become worse.

9. The cost of super- and de-chlorination will be found to compare favorably with most other forms of corrective treatment.

Reference

1. HOWARD, NORMAN J. Progress in Super-chlorination Treatment for Taste Prevention at Toronto, Ont. Jour. A.W.W.A., **23**:388 (1931).

1947 Conference—San Francisco

SAN FRANCISCO, in July 1947, was the scene of an experiment in the conduct of annual conventions—simultaneous meetings of two related but separately organized associations, with a manufacturers exhibit of interest to both. When arrangements for the 1947 Conference of the A.W.W.A. got under way, it was learned that the Federation of Sewage Works Associations was contemplating its annual meeting in California. Discussions of the advantages of simultaneous meetings of the two organizations led to the decision that both would convene in San Francisco during the week of July 21.

The results were satisfactory. It is true that certain problems arose, but they were minor and cannot detract from the facts that engineers and operators of water works and sewage works were able to become better acquainted; that the manufacturers were able to set up a superlative exhibit; and that the technical sessions included more than the normal number of worth while papers.

The registered attendance at the A.W.W.A. meetings was 1,546, and at the F.S.W.A. meetings, 964. The grand total, excluding duplicate registration of manufacturers representatives, was 1,955. The A.W.W.A. registration was the highest ever recorded.

A.W.W.A. registration for the past ten years has been:

Year	*City*	*Total Registered*	*Year*	*City*	*Total Registered*
1938	New Orleans	1,123	1943	Cleveland	1,131
1939	Atlantic City	1,290	1944	Milwaukee	1,356
1940	Kansas City	1,467	1945	*No convention*	—
1941	Toronto	1,445	1946	St. Louis	1,517
1942	Chicago	1,438	1947	San Francisco	1,546

The 1947 Convention Management Committee included:

Representing the A.W.W.A.

WILLIAM J. ORCHARD, *Chairman*
NELSON A. ECKART
ROBERT C. KENNEDY

Representing the W.&S.W. Mfrs. Assn.

JAMES R. BARKER
E. A. SIGWORTH

Ex-Officio

WENDELL R. LADUE, President, A.W.W.A.
HARRY E. JORDAN, Secretary, A.W.W.A.
LINN H. ENSLOW, Chairman, Publications Committee
ALBERT E. PAXTON, President, W.&S.W. Mfrs. Assn.
ARTHUR T. CLARK, Secretary-Manager, W.&S.W. Mfrs. Assn.

Conference Program. The technical program, which was arranged under the chairmanship of Linn H. Enslow, included 69 scheduled speakers. The

quality of the material presented was unusually high. The large size of the meeting rooms made the acoustics less satisfactory than usual, and made it appear that fewer persons were in attendance than is normal. Actually the proportion of the total registrants in attendance at the sessions was not lower than normal.

Exhibits. The exhibits by the Water and Sewage Works Manufacturers Association, under the direction of Arthur T. Clark, Secretary-Manager, were the most extensive which that organization has ever conducted. In this area the value of the concurrent meetings was evidenced most clearly. Convention-goers were able to study the types of equipment used in both industries.

Entertainment. Since San Francisco is a city which offers many opportunities for social diversion, the regularly scheduled entertainment did not occupy so important a place in the entire program. But the entertainment planned under the local direction of John B. Gill, Local Chairman, was both unusual and satisfying.

Special Travel. Under the chairmanship of E. A. Sigworth, arrangements were made for special trains to and from San Francisco. Traveling west, a large party visited Estes Park, Hoover Dam and the Riverside-Los Angeles area. Returning, the party visited Portland, Seattle, Vancouver Island and Glacier Park. Alternate groups made the trips directly from the East to the West coast and return. No previous A.W.W.A. convention ever was provided with such efficiently arranged plans for combining sightseeing with the week of meetings. The work of Mr. Sigworth, Committee Chairman, and Earl Biddle, of the Pennsylvania Railroad, was highly commendable.

Local Committees. Since every person in the San Francisco area who was called upon to assist in operating the convention served willingly and graciously, it is difficult to single out any one person for special mention. Nevertheless, the work done by Nelson Eckart in housing, Mrs. Eckart in ladies entertainment, J. H. Peterson in hotel arrangements, J. W. Pratt in meeting room arrangements, John B. Gill in entertainment, and H. C. Medbery in registration was essential to the success of the convention. Each one of these was supported in his assignment by loyal men and women of the Bay area who confirmed the reputation of San Francisco as a city of gracious people.

Association Awards

Honorary Membership was conferred upon John H. Cook of Paterson, N.J., and Malcolm Pirnie of New York. The citations follow:

JOHN H. COOK, Governor, Society for Establishing Useful Manufacturers, Paterson, N.J.; a member of the Association since July, 1906; for many years a student and leader in the field of hydraulics; associated with the building of many water supplies, he has been closely associated with many developments and advances in the water works field.

MALCOLM PIRNIE, Consulting Engineer, Malcolm Pirnie Engineers, New York, N.Y.; a member of the Association since May, 1917; recipient of the Diven Medal in 1931; Director 1930–1933, 1935–1947; Vice-President 1933; President 1934; Chairman for many years of the Water Works Practice Com-

mittee; President (1944) American Society of Civil Engineers; Fellow, American Public Health Association; member of numerous technical societies. His influence has been world wide as an outstanding leader in both civic and technical affairs during the past thirty years.

The John M Diven Medal, awarded to the member whose services to the water works field during the past year are deemed most outstanding, was presented to E. L. Filby. The citation follows:

E. L. FILBY, for his direction of the activities of the Survey Committee on Public Relations and for his co-ordination of the findings of the inter-Sectional committee in a most timely report of general importance to the public water supply industry.

The John M. Goodell Award, granted for the best paper published in the JOURNAL, was presented to Louis R. Howson. The citation follows:

LOUIS R. HOWSON, for his paper entitled "Guides and Checks on Water Works Operation" as published in the January 1946 JOURNAL (Vol. 38, page 1). In this paper the author discusses a number of items related to the operation and maintenance of water works systems and records typical costs of doing various classes of work. The paper is a valuable guide to the water works executive who wishes to analyze the cost of operating the property under his control.

The George Warren Fuller Awards were presented to twenty-two men whose Sections had honored them during 1946 and 1947—the period from the 1946 St. Louis Conference up to the beginning of the 1947 San Francisco Conference—"for their distinguished service in the water supply field and in commemoration of the sound engineering skill . . . the brilliant diplomatic talent . . . and the constructive leadership of men . . . which characterized the life of George Warren Fuller." The list of awardees follows:

California Section—CHESTER GORDON GILLESPIE: For his inspiring leadership and continuing energy in upbuilding research in technical phases of water purification throughout the state of California.

Canadian Section—MAC HARVEY MCCRADY: For notable accomplishments in the water works field and in the affairs of this Association, especially in the development of standard methods for water examination and in the interpretation of laboratory analyses.

Cuban Section—JUAN ANTONIO COSCULLUELA: For his leadership in water works engineering in the Republic of Cuba, and for his inspiration to the engineering students in the University of Havana.

Florida Section—CLAUDE FRANKLIN WERTZ: For his engineering skill and long service to the water works profession; his unselfish interest in promoting activities of the Section and Association; and for his contribution to the success of the joint meeting of the Florida and Cuban Sections.

Four States Section—SHEPPARD TAPPEN POWELL: For his outstanding and internationally recognized work in the treatment of industrial water.

Illinois Section—CLIFFORD HENRY FORE: For his splendid response to an appeal for aid, representing service beyond the line of duty, in restoring to service the public water supply facilities of a neighboring community.

Indiana Section—LEO LOUIS JR.: For his accomplishment in promoting the finest professional relations between regulatory and local personnel; his advancement of the interests of the Indiana Section; and his assistance in the presentation of a constructive educational program among the men of the water works field.

Michigan Section—WILLIAM LESLIE HARRIS: In recognition of his untiring efforts on behalf of the Michigan Section; his contributions as a member of the Board of Examiners on certification; and his resourcefulness in instituting fluoride treatment of a public water supply for the control of dental decay.

New Jersey Section—HARRY NELSON LENDALL: For his contribution to the American Water Works Association in the fields of education and research; for his years of service to the New Jersey Section as its Secretary-Treasurer and Director.

New York Section—JOHN GILBERT COPLEY: In recognition of his efficient management of the Elmira Water Supply system, an outstanding example of municipal ownership; and of his inspiring efforts to promote the welfare of the operators of smaller water works in the state.

North Carolina Section—M'KEAN MAFFITT: For his long, conscientious and efficient service to his community; and for his extraordinarily generous promotion of A.W.W.A. membership and activities.

Ohio Section—LORIN JOHN HOFFMAN: In recognition of his activity as Secretary of the Section in promoting the interests of the Association among water works men; in addition to his progressive faithful service to the Akron Water Works.

Pacific Northwest Section (1946)—WALTER JACOB MOORE: His engineering skill, managerial ability and high ideals of public service have been exemplified in the system he has built.

Pacific Northwest Section (1947)—GUSTAVE BERNHART SCHUNKE: For distinguished service in the water supply field and in commemoration of his sound and successful business and administrative skill.

Rocky Mountain Section—WILLIAM VERNON LEONARD: For his tireless efforts, abounding energy and devotion to the Rocky Mountain Section affairs in guiding the Section effectively through its first postwar year.

Southeastern Section—FRANCIS WORTHINGTON CHAPMAN: In recognition of his fine studies on the corrosion of service pipes and jointing materials for pressure mains; and in the removal of tastes.

Southwest Section—WINFIELD SCOTT MAHLIE: For outstanding public service in faithfully and untiringly serving the Water Works Operators Short School and the State's voluntary licensing program; and for constantly exemplifying the highest traditions of the profession.

Virginia Section—ROBERT WARNER FITZGERALD: In recognition of his outstanding service in maintaining and improving the water supply for the Norfolk Base Area during the critical war period; and for his research work and application of methods in removing objectionable color and tastes from surface water.

Western Pennsylvania Section (1946)—DANIEL ELIAS DAVIS: In consideration of his water works studies, designs and developments; his services on various water works committees; his years of service as a consulting engineer

and his active participation in the advancement of the aims and objectives of the water works associations.

Western Pennsylvania Section (1947)—CHARLES HENRY YOUNG: For his constructive guidance of water works operators in Western Pennsylvania and for his loyalty to the Section since its organization.

West Virginia Section—JOHN CHUBBUCK EDWARDS: For outstanding service to his community through the efficient performance of his duties in water purification and his continued unassuming service to West Virginia water works organizations over the past eighteen years.

Wisconsin Section—JAMES WALDEN MYERS JR.: For his outstanding accomplishment in the reduction of water losses and for his constant and keen interest in Section activities.

The Nicholas S. Hill Jr. Cup, awarded annually to the Section making the largest weighted gain in membership, was presented to the young Kansas Section, which had attained a record score of 155.7. Second and third places went to the Michigan and California Sections.

The Henshaw Cup, awarded annually to the Section having the greatest percentage of its members present at the Section's annual meeting, was presented to the Cuban Section. The winning score was 72.22 per cent, with the North Carolina Section close behind with 69.14 per cent. Third place went to the Kansas Section, with a score of 64.51 per cent.

The Old Oaken Bucket, which this year provided the theme for the Conference, was appropriately awarded for the eighth successive year to the California Section as the largest Section in the A.W.W.A.

Schedule of Conference Papers and Reports

General Session—10:00 A.M.—July 21, 1947

The Colorado River, the Southwest's Greatest Water and Power Resource.....S. B. Morris
The Problem of Water Development on Pacific Islands With Special Reference to Salt Water Intrusion.....Frederick Ohrt
Hydro-pneumatic Pumping Stations.....O. G. Goldman

Joint Session—Plant Management and Finance & Accounting Divisions—2:00 P.M.—July 21, 1947

Recent Revenue Bond Legislation.....L. N. Thompson
Experiences in Revenue Bond Financing.....S. B. Robinson
How Shall Rate Structures Be Adjusted to Meet Rising Cost Levels?.....L. R. Howson
Symposium—Water Main Extension Policy.....W. V. Weir, M. P. Hatcher, F. R. Berry, E. F. Dandridge, L. S. Finch and C. M. Hoskinson

Water Purification Division—2:00 P.M.—July 21, 1947

Selection and Control of Sampling Points in a Distribution System.....K. W. Brown
Why (and How) Disinfect Water Mains?.....C. K. Calvert
Preliminary Report of Committee on Open-Air Reservoirs.....N. J. Howard
Pollution of Potable Water by Macroscopic Organisms.....J. C. Weart and C. W. Klassen

General Session—9:30 A.M.—July 22, 1947

Applying Business Principles to Water Works Operation.....G. E. Arnold
Value of Public Service Commission Control to Municipal Water Works Management.....
A. P. Kurana
The Washington Suburban Sanitary District—28 Years of Operations.....
H. R. Hall and H. B. Shaw
Water Works Rules and Regulations—What Should They Contain?.....M. P. Hatcher

Water Purification Division—9:15 A.M.—July 22, 1947

Disposal of Wastes From Water Purification and Softening Plants.....W. W. Aultman
Separation of Water From Solid-Liquid Mixtures.....A. A. Kalinske
Control of Slime Growth in Transmission Lines.....R. L. Derby
Super-chlorination and De-chlorination Experiences.....N. J. Howard and C. J. Lauter

Joint Session—A.W.W.A. & F.S.W.A.—Ground Water Pollution Problems—2:00 P.M.—July 22, 1947

Basic Concepts in Ground Water Law.....A. P. Black
Ground Water Production Works.....Malcolm Pirnie and R. W. Sawyer
Formulating Legislation to Protect Ground Water From Pollution.....B. E. Doll
Developing Standards for Protection of Ground Water From Pollution.....R. F. Goudey
Discussion.....*Led by* Frank M. Stead

General Session—9:30 A.M.—July 23, 1947

The Program of the A.P.H.A. for Engineering Personnel....W. T. Ingram and F. B. Elder
Upgrading the Water Works Industry.....J. H. Murdoch Jr.
Engineers' Organizations for Labor Bargaining Purposes.....S. S. Green
The Significance of Antistrike Legislation Directed Toward Public Employees..W. R. LaDue

Joint Session—A.W.W.A. & F.S.W.A.—Reclamation of Sewage Effluents—2:00 P.M.—July 23, 1947

Industrial Uses for Reclaimed Sewage Effluents.....N. T. Veatch
Discussion.....Earnest Boyce
Use of Reclaimed Sewage Effluents of Baltimore.....Abel Wolman
Discussion.....R. F. Goudey
Agricultural Uses for Reclaimed Sewage Effluents.....L. V. Wilcox
Discussion.....Dario Travaini
Limits of Pollution of Water for Industrial Use.....S. T. Powell
Discussion.....A. M. Buswell

Joint Session—Plant Management and Finance & Accounting Divisions—9:30 A.M.—July 24, 1947

Testing Materials and Equipment for Water Works Construction and Operation.....
W. W. DeBerard and H. P. Hagedorn
Results of Fifteen Years of Underground Street Leakage Work in Chicago.....J. B. Eddy
Notes on Long Line Hydraulic Studies: Equipment and Procedures.....Fred C. Scobey
Experience With Steel Pipelines After Lining in Place.....William G. Banks
Discussion.....W. R. LaDue
Life Stream (*A motion picture*).....M. P. Hatcher

General Session—2:00 P.M.—July 24, 1947

Lessons in Water System Design Derived From World War II..... H. S. Swanson and S. A. Evans
Discussion.....L. H. Enslow
Erosion Control in Mountain Areas of California.....C. J. Kraebel
Erosion Control in Watersheds of the East Bay Municipal Utility District.....L. S. Hall
Erosion Control in Watersheds of the Los Angeles Department of Water & Power..... B. S. Grant

Water Purification Division—2:00 P.M.—July 24, 1947

Operating Characteristics of Synthetic Siliceous Zeolites..... L. Streicher, H. E. Pearson and A. E. Bowers
Use and Interpretation of Langelier Stability Diagram.....W. B. Lawrence
Calculation of the pH of Saturation of Tricalcium Phosphate..... Jerome Green and J. A. Holmes
Chemical Fixation of Oxygen in Industrial Water Supplies.....D. J. Pye

General Session—9:30 A.M.—July 25, 1947

The Use of Radio in Water System Operation and Maintenance.....Adolph Damiano
Discussion.....B. A. Currie and W. C. Morse
Should Public Water Supplies Be Used as a Means of Mass Medication?.....Abel Wolman
Inter-industry Problems Derived From Cathodic Protection.....F. E. Dolson
Discussion.....L. J. Alexander and F. D. Pyle
Municipal vs. Residential Water Softening.....D. L. Maffitt
Discussion.....H. M. Olson

Papers Scheduled at Section Meetings

THERE follows a chronological listing of papers scheduled for presentation at 1947 Section Meetings. The dates of the Section Meetings from 1943 to 1947 and locations for 1947 are given on page 1262. Section officers who were elected at meetings held during 1947 are listed on page vi of this issue.

Kansas Section—March 13–14, 1947

Water Rates.....A. P. Learned
Discussion of Proposed Water Works Organization Study.....
Major C. Hagar and Robert S. Millar
Kansas Ground Water Resources.....V. C. Fishel
A State Plan of Water Resources Development in the Neosho River Basin.....R. V. Smrha
The Operation and Maintenance of Wells.....D. R. Soder
Panel Discussion—Public Relations.....Robert S. Millar
H. H. Kansteiner, Alar Mawdsley, Clyde B. King and E. L. Filby
Clean Waters.....*A Motion Picture*
Sizing Water Meters.....P. J. Dominick
Bacteriology of Drinking Water.....C. A. Hunter
Panel Discussion—Water Works Administration.....
E. J. Allison, N. T. Veatch, Ray Nixon and R. V. Gilcrest
Panel Discussion—Sewage Disposal Problems.....
Murray A. Wilson, O. M. Goodrich, E. L. Filby and Neal Harr

Minnesota Section—March 13–14, 1947

Address of Welcome.....*Mayor* John McDonough
Response.....D. B. Morris
Public Health and the Water Works Operator.....W. N. Venable
Discussion.....W. W. Towne
The Design, Operation and Maintenance of Deep Wells.....Lee Rogers
Discussion.....*Led by* C. R. Poda
Panel Discussion—Are You Prepared for a Catastrophe?.....H. M. Bosch
C. C. Ludwig, Sanford Herberg, Carl R. Myers and A. M. Kirchner
Panel Discussion—What the New U.S. Public Health Standards Mean to You.....
O. E. Brownell and A. C. Janzig
Municipal Water Works Organizations.....H. S. Grow
Panel Discussion—What Constitutes Good Records—and Their Importance in Efficient Operation.....Carl Flack, William Hurst, Arthur F. Mellen and William Yeger
The Removal of Iron and Manganese.....Everett R. Mathews
Panel Discussion—Our Public Relations.....
Leonard N. Thompson, Edgar W. Johnson and Milton Rose
The Application of Chlorine Dioxide to Potable Water Supplies.....R. N. Aston
Fluoride Treatment of a Public Water Supply.....W. A. Jordan

New York Section—April 10–11, 1947

Address of Welcome.....*Mayor* Bernard J. Dowd
A Review of Mutual Aid War Operations and Possibilities for Continuance..Earl Devendorf
The Development and Improvement of the Buffalo Water System.....Jerome Kreinheder
The Use of Chlorine Dioxide for Taste and Odor Control.....R. N. Aston
Discussion.....*Led by* Ralph D. Bates
This Job of Ours and Public Relations.....Wendell R. LaDue
Installing Cast-Iron Pipe.....*A Motion Picture*
Panel Discussion.....*Led by* Simon P. Carman
Public Relations As You See It
Material Shortage Problem—Its Cause and What You Can Do About It
Your Experience in Supplying Water for Air Conditioning
That Problem Which You Meant to Bring Up At the Last Meeting

Nebraska Section—April 11–12, 1947

Address of Welcome.....*Mayor* Lloyd J. Marti
Chlorination Practices.....J. A. Strang
Round Table Discussion—Administration and Management Problems of Water Utilities....
Led by John C. Detweiler
Today's Problems in Purchasing Materials and Supplies.....F. W. Moeller
Adequate Wiring and Its Relation to Our Municipal Utilities.....J. Dore

Canadian Section—April 14–16, 1947

Address of Welcome.....*Mayor* Camillien Houde
Address.....W. R. LaDue
Water Purification Practice in Quebec.....T. J. Lafrenière
Laboratory Procedures in Water Examinations With Reference to Water Standards.....
M. H. McCrady and Jacques Archambault
Guided Discussion—Problems in Water Purification.....*Led by* J. H. Harrington
Advances in Flow Metering and Controlling.....Charles G. Richardson
Cleaning, Restoration and Preservation of Water Mains.....F. Y. Dorrance
Guided Discussion—Distribution System Maintenance.....*Led by* W. E. MacDonald
Opération et Entretien de l'Outillage Pour le Traitement des Eaux.....M. A. Gaboury
Variations Dans le Taux de la Consommation d'Eau.....E. A. Delisle
Periode de Questions et Reponses.....*Led by* A. J. Deslauriers
Reservoir Economics.....N. G. McDonald
Guided Discussion—Sanitary Control and Maintenance of Service Reservoirs and Standpipes
Led by N. J. Howard
Montreal's Water Works Extension Program.....C. J. Des Baillets
Guided Discussion—Public Relations in Water Works.....*Led by* H. L. Doane
Water Rate Structures in Quebec.....A. Larivière
Guided Discussion—Economics and Maintenance Problems in Connection With Consumers'
Meters.....*Led by* J. C. Keith

Illinois Section—April 17–18, 1947

Address of Welcome.....John P. Harris
Atomic Power and Its Implications for Industry.....Milton Burton
The Illinois Water Supplies—Past, Present and Future.....Louis R. Howson
Municipal and Utility Pension Act.....A. S. Hanson
Discussion.....H. S. Merz
Salaries: Water Works vs. Private Industry.....W. H. Trentlage
Discussion.....John A. Goetz
Accidents—Their Cause and Prevention.....H. F. Webb
Discussion.....H. H. Gerstein

Plant Maintenance, Operation and Distribution.....C. C. Larson
Round Table Discussion:
Wells and Mains.....Frank C. Amsbary Jr.
Filter Plant.....A. E. Anderson
Meters—Domestic and Commercial.....Marshall S. Dutton
Plant Meters.....Max Fishtein
Chlorinating Equipment.....Jeff Abplanalp
Taste and Odor Control at Chicago South District Filtration Plant.....John R. Baylis
Municipal Water Works Organization in Illinois.....W. R. Gelston
New Angles in Water Analysis.....James Weart
Futures of Well Supply.....A. M. Buswell
Discussion.....Carl Duy
Maintenance of Wells and Deep Well Pumps.....Edwin F. Smith
Well Cleaning.....G. N. Andrews

Montana Section—April 25–26, 1947

Address of Welcome.....*Mayor* J. A. Wright
Response.....J. M. Schmit
This Job of Ours.....Wendell R. LaDue
Panel Discussion—Public Relations...*Led by* H. S. Thane, F. F. Palmer and Roy N. Arnold
Committee Report—School for Water and Sewage Works Operators.....
W. M. Cobleigh and H. B. Foote
Municipal Water Works Organization.....Arthur Johnson
Panel Discussion—1946 Drinking Water Standards.....
Led by John Hazen, C. W. Eyer, Stewart Voden and C. T. Carnahan
Panel Discussion—A.W.W.A. Specifications for Drilling Water Wells.....
Led by L. E. Anderson
Round Table Discussion.....*Led by* S. R. Young

Indiana Section—May 7–9, 1947

What Are Our Water Resources?.....Charles H. Bechert
Algae in Water.....C. Mervin Palmer
How Do You Figure the Needed Capacity of an Elevated Storage Tank?.....
Donald H. Maxwell
How Do You Control Corrosion?.....O. M. Leonard
New Developments in Design of Elevated Steel Tanks.....Donald A. Leach
Does It Pay to Clean Water Mains?.....James R. Brown
The Program of the Indiana State Board of Health.....L. E. Burney
Water Works Organization and Financing.....Otto Jensen
How Should Charges for Public Fire Protection Be Fixed?.....Fred R. Witherspoon
Are War Surplus Materials Worth Purchasing?.....H. J. Draves
This Job of Ours.....Wendell R. LaDue
What Good Is an Operator's Manual?.....Marshall P. Crabill
Why Bother With Meter Testing?.....Glen Garman
Water Works Economics.....W. E. Howland

Pacific Northwest Section—May 15–17, 1947

Address of Welcome.....*Mayor* Percy E. George
Response.....Charles H. Williams
Panel Discussion—How Has the Problem of the Urban Fringe Been Handled?.....
Walter J. Moore, Ralph Davis, O. E. Hill, Robert A. Duff,
W. P. Hughes, W. A. Kunigk and Ben S. Morrow
Proposed Development of the Greater Victoria Water Supply Systems.....G. M. Irwin

The Place of the Water Department in City Planning and How It Should Be Represented... Fred A. Cuthbert
The Financial Basis of Utility Rate Structures.....Barclay Sickler
Panel Discussion.....
John W. Cunningham, F. Ford Northrop, James E. Morrison and G. B. Schunke
New Housing Developments—Water and Sewer Problems.....Frank Field
Water Meters Earn Their Keep.....George Sopp
Round Table Discussion—Public Relations.....Thomas H. Judd, W. P. Hughes, Fred D. Jones, E. A. Knittel, C. V. Signor and W. G. Wilmot
Panel Discussion—Analysis of Public Water Supply Legislation.....
J. C. MacDonald, A. C. Van Soelen, H. C. Clare and Eugene Marsh
Panel Discussion.....E. L. McCleary, Carl Gunther, Samuel Cromwell, N. A. Gilman and Bert L. Terry
Rates and Service Policies to Districts
Rates and Service Policies to Out of City Users
Rates to Apartments and Multiple Dwellings
Organization and Operation of Subsidiary Districts
Construction and Sanitary Standards in Subsidiary Districts
Panel Discussion.....H. R. Vinson, Fred D. Jones, Thomas H. Judd, C. V. Signor, F. E. Clark and Walter S. Chiene
Can Water Rates Be Maintained in the Face of Rising Prices and Expanding Population?
Should There Be a Uniform Policy of Restriction on Summer Usage?
Will Peak Demand Become a Basis for Surcharges Rather Than a Basis for Step Reductions in Water Rates?
Charge for Large Meters—Customer or Utility?
Economy in the Design of Small Filter Plants.....John C. Gearhart
Factors Affecting the Design of Water Distribution Systems.....Holly A. Cornell
The Principles of Reservoir Design.....F. S. Zeidlhack
Soil Cement in Reservoir Construction.....Ray Heath
Automatic Control.....H. W. Kramer
A Cross-Connection Survey.....Jerry Allen
The Treatment of a Highly Colored Water.....C. R. Harlock
Laying a 36-Inch Main Through City Traffic.....S. J. Benedict
Water Supply Standards and How to Maintain Them.....
H. C. Clare, Emil Jensen and Curtiss M. Everts Jr.
National Board Grading Schedule and Fire Insurance Rates..W. F. White and J. Paul Braun
Plans for Local Water Works Operators Conferences in Oregon.....Curtiss M. Everts Jr.
Willamette Valley Basin Flood Control.....Ivan Oakes
Experiences in Annexation of Fringe Areas.....R. H. Windishar

Western Pennsylvania Section—June 12–13, 1947

Methods of Collection and Development of Ground Water.....John H. Adamson Jr.
Discussion:
The Installation of a Radial Water Collector on Neville Island.....Douglas E. Chase
New Water Field Development at Ambridge, Pa.....Edward C. Taggart
Demonstration—Activated Silica for Improving Floc Formation by Bayliss Process.....
William Baumgartner and Walter Placzankis
Discussion.....James P. Stowe
Pollution of Public Water Supplies by Coal Strip Mining.....Raymond H. Snyder
Discussion.....Joseph A. Beck, William J. Murdock and Carl Kear
The New Cherry Valley Water Supply of West Penn Water Company....John T. Campbell
Unaccounted-for Water.....Charles Haydock
Discussion.....James G. Griffiths and G. V. Gustafson
Economics of Pipeline Rehabilitation.....B. A. Noel
Operation of Pension Plan at Erie, Pa.....John D. Johnson

New York Section—September 4–5, 1947

Ground Water Supplies in the State of New York.....M. L. Brashears Jr.
Recent Trends and Developments in Water Supplies.....C. R. Cox
Panel Discussion.....*Led by* S. P. Carman
Corrosion and Its Control
Adequacy of Present Water Rates
Softening of Ground Water Supplies
Labor Costs and Labor Saving Methods

Michigan Section—September 18–20, 1947

Address of Welcome.....*Mayor* M. Raleigh Rabedioux
News of the Field.....John E. Vogt
Saginaw-Midland Water System.....Louis R. Howson and Vernon R. Kneer
The Story of the Diatom.....*A Motion Picture*
Magnesium for Cathodic Protection of a Municipal Water System.....Arthur Smith Jr.
Concrete Water Storage Reservoir for Detroit.....Leo Garrity
Elevated Tank Maintenance.....Edward Alt and Robert Norris
The Heat Pump.....Claude Erickson
Home Zeolite Service.....Harry McDuff
Gadgets.....John Rubbo and Earl Norman
Recalcining Sludge as Proposed for the Pontiac Softening Plant.....Bernal H. Swab
Enabling and Restrictive Legislation Relative to Public Water Supply in Michigan.....
John M. Hepler
New Total Alkalinity Indicators.....Michael Taras

Kentucky-Tennessee Section—September 22–24, 1947

Address of Welcome.....H. M. Gerber
Response.....C. M. McCord
Labor Relations.....Joseph L. Quinn
Panel Discussion—Labor Relations.....E. E. Jacobson, V. A. Appleyard and Jack Boxley
Present-Day Problems of Financing Water and Sewage Works Improvements..Grant S. Bell
Panel Discussion—Present-Day Problems of Financing Water and Sewage Works Improvements.....G. Reynolds Watkins, J. S. Parker, Chester Lucas and John Williamson
General Discussion Panel....W. H. Lovejoy, Clark J. Cramer, Earl Mitchell and S. L. Jones
Historical Development of Sewage Treatment.....George S. Russell
Milk Waste Disposal.....Don E. Bloodgood
Panel Discussion—Industrial Waste Treatment Problems.....
W. J. Eldridge, A. B. Davidson, Cecil S. Camp and S. L. Jones
Modern Trends in Sewage Treatment Plant Design.....Maurice L. Miller
Panel Discussion—Modern Trends in Sewage Treatment Plant Design.....
R. Paul Farrell, F. C. Dugan, G. R. Watkins and Grant S. Bell
Recent Improvements at Louisville Water Co.....Louis R. Howson and B. E. Payne

Rocky Mountain Section—September 25–26, 1947

Address of Welcome.....*Gov.* Lee Knous
Response.....Maynard Graham
Planning for the Future Water Needs of Your Community.....John Burgess
Discussion.....D. P. Porter, Carl Bennett and G. H. Palmes
Planned Maintenance of Water Works.....Harry E. Jordan
Economical Use of Water in Air Conditioning.....V. A. Vaseen
Municipal Financing.....H. E. Cramer
Discussion.....K. E. Darling
Ground Water Development, Conservation and Replenishment.....E. W. Bennison

Legal Aspects Concerning Water Rights and Municipal Water Works Officials.....
Glenn G. Saunders
Colorado Highways.....*A Motion Picture*
Minimum Requirements for Certifications of Public Water Supplies for Common Carriers...
G. E. Riepe
Discussion.....L. O. Williams
Discussion.....W. H. Booker
Water Samples for Bacteriological Examination and Chemical Analysis—Their Significance and Importance.....George J. Turre
Discussion.....Charles T. Wright
Discussion.....W. V. Leonard
Importance of Maintaining Proper Fluorine Content in Drinking Water....Robert A. Downs
Status of Water Works Equipment and Supplies.....Dana E. Kepner
Valves and Dry Feed Machines.....J. O. Brown
Steel Pipe.....Ralph Tracy
Concrete Pipe.....W. B. Freeman
Transite Pipe.....Jack Davis
Cast-Iron Pipe.....J. M. Warner

Ohio Section—September 30–October 2, 1947

Address of Welcome.....*Mayor* James A. Rhodes
Response.....Paul D. Cook
Residual Chlorine Tests.....A. E. Griffin and N. S. Chamberlin
Panel Discussion—Why Bother With Meter Maintenance?.....*Led by* F. H. Donaldson
Chlorine Dioxide Applied to Water Treatment.....Roy Aston
Clear Water.....*A Motion Picture*
Panel Discussion—What! No Problems in Water Purification.....*Led by* Earl Wittmer
Is It Legal?.....L. T. Fawcett
Panel Discussion—Kinks of Distribution Maintenance.....*Led by* A. S. Hibbs
River Infiltration a Source of Ground Water.....Raphael G. Kazmann
Chlorine Emergency.....*A Motion Picture*
Panel Discussion—Public Relations Prescription.....*Led by* Dan Laurence
You Produce the Water—We'll Fight the Fires.....William Serrie
How to Run the Water Office.....L. J. Hoffman
Rehabilitating Wells and Equipment With Chemical Solvents.....J. S. Talbot
Short Water Works Schools for Ohio?.....T. C. Schaetzle
Discussion.....F. D. Stewart
Discussion.....Charles Bird
Use and Reuse of Industrial Water.....Charles F. Hauck
Sludge Reactors in Water Treatment.....Samuel B. Applebaum
Symposium on Pipe—Relative Merits.....*Led by* Homer Knox

West Virginia—October 2–3, 1947

Address of Welcome.....*Mayor* A. Harry Vest
Response.....H. Cable Cramer
Short Cuts and Labor-Saving Kinks.....Nick Leshkow
Looking Ahead With A.W.W.A.....Linn H. Enslow
Know Your Valves and Hydrants.....A. G. Scheinert
Intake and Plant Improvements at Williamson.....Frank Offutt
Engineering Pays Dividends in Small Water Systems.....W. D. Kelley
Safety in the Water Works.....John B. Douglass
Maintenance of Zeolite Beds.....Perkins Boynton and Henry Gay

Ground Water Investigations in West Virginia.....H. F. Johnson
Recent Developments in Water Treatment.....A. R. Todd
Guided Discussion—Keeping Costs Down.....*Led by* W. S. Staub
Guided Discussion—Questions From the Floor.....*Led by* H. Cable Cramer

Arizona Section—October 9–11, 1947

Address of Welcome.....A. L. Garrison
Evaluation of Present-Day Protective Coatings for Steel and Concrete.....A. F. Pistor
Watering Point Sanitation.....Kaarlo W. Nasi
Federal Park Service Sewage and Water Facility Problems.....C. M. Carrel
Diatomaceous Earth Filtration as Applied to Water Supplies.....Ray L. Derby
Steel Pipe Specifications and Installation.....W. W. Hurlbut
Illustrated by: Stone Canyon Steel Pipeline.....*A Motion Picture*
Round Table Discussion.....*Led by* G. E. Arnold
Operators' Roundup.....George W. Marx
Cures for Operators' Headaches.....A. Anton Frederickson
High-Lift Pumps at Grand Canyon.....George L. Davenport Jr.
Practical Control of Sulfides.....D. R. Kennedy
El Paso's New Water Supply.....C. W. Christenson
Phoenix Sewage Plant Expansion.....O. Richard Lindstrom
Pictorial Views of Construction at Phoenix Sewage Plant.....Jack Hatchel
Round Table Discussion.....*Led by* J. A. Carollo

Iowa Section—October 9–11, 1947

Address of Welcome.....*Mayor* F. K. Hahn
Response.....John W. Pray and C. O. Alexander
Panel Discussion—Ground Waters:
Geology.....H. G. Hershey
Construction.....Theodore R. Lovell
Mineral and Sanitary Quality.....Gilbert Kelso
Round Table Discussion—A Water Superintendent's Problem in Face of Increased Costs....
Led by H. F. Blomquist
Conclusions of Experiences of Wartime Sewage Treatment in the Armed Forces.....
Don Walker
Discussion on Design of Plants, Wet Wells, Grit Chambers, etc.....D. C. Mullinex
Safety Measures in Sewage Plants.....S. H. Smith
Corrosion Preventive.....Floyd Heller
Round Table Discussion—Are the Salaries, Wages, Pensions and Compensations Paid to Public Utility Employees in Line With Those of Private Utilities?.....
Led by Dale Maffitt and C. O. Alexander
The Effect of Recent Floods on Water Supply and Sanitation.....J. A. Sampson
Round Table Discussion—Care and Operation of Electrical Equipment.....Joe J. Hail
Training and Licensing of Plant Operators.....P. Galligen and Charles Alexander
Stream Pollution Legislation.....Paul Houser
Round Table Discussion—New Developments in Water Works and Sewage Fields.....
Led by Howard Green
What My Membership in the A.W.W.A. Has Done for Me.....Frank Fisher
Round Table Discussion:
Sterilization of Water Mains, Elevated Tanks and Reservoirs.....
Stand-by Power for Emergency Use Only.....
Open Meeting—How Can We Improve Our Annual Convention?.....
Disposal of Sludge.....G. C. Ahrens

Southwest Section—October 12–15, 1947

Address of Welcome.....*Mayor* L. R. Hagy
Response.....Albert R. Davis
Panel Discussion—State Legislation on Control of Underground and Surface Water Resources—Present Conditions and Future Needs:
Texas.....E. V. Spence
Oklahoma.....Clarence Burch
Louisiana.....John E. Trygg
Panel Discussion—Program and Objectives of the Texas Construction Council.....
C. P. Dodson, H. R. F. Helland and Homer D. Grant
Stand-by and Ready-to-Serve Charges for Water Service.....David Pfeiffer
Algae Control in Reservoirs of the Southwest.....B. B. Harris
Corrosion in Water Lines and Plumbing Fixtures.....R. M. Dixon
Liquid Air Demonstration.....C. W. Seibel
Selection of Well Pumps.....Axel Fabrin
Taste and Odor Control of Shreveport Water Supply.....B. G. Cole
Panel Discussion—Public Relations From Three Points of View:
Customer.....Rex Webster
Employee.....Opal Seay
Superintendent.....M. B. Cunningham
Life Stream (*A motion picture*).....M. P. Hatcher

Wisconsin Section—October 23–25, 1947

Address of Welcome.....*Mayor* Bohn
How Shall Rate Structures Be Adjusted to Meet Rising Cost Levels.....Louis R. Howson
Public Relations.....Wesley Blish
Panel Discussion—Operating Statistics for Management.....*Led by* R. E. Cannard
The Care and Calibration of Recording Instruments.....
J. E. Kerslake, H. C. Schmitt and Leonard Leader
Tomorrow's Water Works and Some Unfinished Business of Today.....Linn H. Enslow
Panel Discussion—Personal Experiences Not for Publication...*Led by* William U. Gallaher
Copper and Its Alloys.....*A Motion Picture*
Geophysical Logging in the Development and Operation of Ground Water Supplies.....
Carl A. Bays
A "Well" of a Lot of Water.....Joseph Lustig
Panel Discussion—Ground Water Problems.....*Led by* O. J. Muegge
Maintenance and Operation of Water Tanks.....William Hammann
Panel Discussion—Distribution Problems.....*Led by* Frank Quimby

Southeastern Section—November 3–5, 1947

Address of Welcome.....*Mayor* W. B. Hartsfield
Response.....W. H. Weaver
Rural "Waterfication".....W. H. Weaver
Dental Implications of Fluorine-Bearing Water.....H. T. Dean
Corrosion Control Measures.....Danilo Prodanovich
On-the-Job Training.....W. A. Hardenbergh
Obtaining Additional Revenue to Meet Increased Cost of Operation of Water and Sewage Plants.....H. F. Wiedeman
Clean Waters.....*A Motion Picture*
Stream Utilization and Quality Control.....W. H. Weir
Lubrication of Water and Sewage Plant Equipment.....D. C. Rand

New Jersey Section—November 6–8, 1947

The Manufacture of Reinforced Concrete Prestressed Pipe at Wharton, N.J.....
A Motion Picture
The Pittsburgh-Eric Process of Pipe Lining.....Alfred B. Anderson
Electrification of Water Works Pumping Stations and Filter Plants.....A. C. Hutson
Presence of Fluorine in the Water Supplies of New Jersey.....John E. Bacon
Fluorine in Water Supplies as a Measure of Dental Health.....J. M. Wisan
Operating Sheets—A Streamlined Procedure for Shutting Down Large Water Mains in Case of a Break.....Laurie M. Leedom
Meter and Service Sizing.....Edward Walasyk
Panel Discussion—Liability for Damage Resulting From Water Operations and Appurtenances.....*Led by* Ralph E. Bentley
Breaks Causing Flood Damage.....Harold M. Ohland
Leaks Causing Undermining.....Charles G. Bourgin
Curb Boxes Causing Injuries.....Ralph L. Tyler
Cross-Connections Causing Illness.....Harry P. Croft
Compendium.....Benjamin J. Spitz
Round Table Discussion.....*Led by* E. Arthur Bell
Radio for Small Water Works Operation
Unusual Uses for Chlorine
Jointing Compounds
Meter Ownership—Water Company *vs.* Customer

Virginia Section—November 17–18, 1947

Current Water Supply Construction Costs.....E. R. Sharp
Discussion.....*Led by* Edward H. Ruehl
Beautifying Virginia's Water Works.....Harold Neale
Discussion.....*Led by* Martin Johnson
Maintaining Good Public Relations.....M. Carl Andrews and Linn H. Enslow
Discussion.....*Led by* Eugene F. Dugger
Panel Discussion—Plant Maintenance:
Keeping Filter Beds Clean and Sweet.....R. W. Haywood
Maintaining Mechanical Equipment.....C. F. Otey
Housekeeping in a Water Plant.....Lewis T. Jackson
Elevated Tank Maintenance.....B. W. Marchant
Discussion.....*Led by* G. E. Borst
Waste Water Surveys.....P. H. McGauhey
Stream Pollution.....Richard Messer and L. L. Hedgepeth
Question Box.....*Led by* D. R. Taylor

Four States Section—November 19–21, 1947

Address of Welcome.....Gordon S. Young
Response.....Schuyler C. Blackburn
Construction of Prestressed Wire Concrete Water Tanks (*A motion picture*).....
Stanley E. Kappe
Weather Cycles—Their Effect on Water Supplies.....Charles G. Abbott
Discussion.....C. F. Merriam
Air Conditioning and Water Needs.....Elwood L. Bean
Discussion.....Robert Arnold
Discussion.....J. S. Strohmeyer
Construction Costs—What We May Expect.....Francis S. Friel
Discussion.....E. C. North
Discussion.....J. C. Carpenter

Round Table Discussion—Public Relations:
Increasing Rates.....R. I. Dodd
Promotional and Educational.....Donald O'Reilly
What a Small Town Is Doing.....Joseph S. Benton
Control of Bacteriological Quality in Distribution Systems.....George Schuker
Discussion.....W. H. Cary
Discussion.....Carl A. Hechmer
H_2O-oh-OH! in a Housing Development.....A. P. Bell
Chlorine—Supply and Demand.....J. O. Logan
Electrolytic Deposition of Asphalt as Means of Pipe Protection.....George H. Dann
Discussion.....A. B. Anderson
Installation of a Series of 32-in. Valves in Existing Lines.....A. A. Bailey
Use of 4-Way Valves in Washington.....Thomas M. Latimer

Cuban and Florida Sections—November 20–22, 1947

Addresses of Welcome.....*Mayor* Bruce B. Blackburn, William F. Davenport and Carlton F. Sharpe
Responses.....T. M. Victory and Harry T. Oberly
The A.W.W.A. and Its Affairs.....Harry E. Jordan
Municipal Water Works Organization in Florida.....W. A. Glass
Forty Years of Successful Checking of Droughts in Cuba With Sunspot Theory.....H. J. Montoulieu
Principles of Cathodic Protection.....F. P. Macdonald and L. P. Sudrabin
Community Public Relations.....Albert A. Ady
A General Discussion of Water Problems in Florida.....A. G. Matthews
Some of the Ground Water Problems in Florida.....Herman Gunter
The Role of Water Resources Investigations in Our National Economy..George E. Ferguson
The Geology of Cuba.....Jorge Broderman
Water Supply of Mexico City.....Francisco Garcia Sainz
Rainfall Intensity Data.....Juan L. Radelat
Water Rates and Service Charges.....Harold D. Briley

Section Meetings—1943–1947

Section	*1943*	*1944*	*1945*	*1946*	*1947*	*Meeting Place—1947*
Alabama-Mississippi	——	——	——	——	May 23–24	Birmingham, Ala.
Arizona	——	——	——	——	Oct. 9–11	Grand Canyon, Ariz.
California	Oct. 27–30	Oct. 24–26	Oct. 23–25*	Oct. 22–25	——	
Canadian	Apr. 7–9	Apr. 19–21	Mar. 19–21	Apr. 8–10	Apr. 14–16	Montreal, Que.
Cuban	Oct. 4	——	——	Nov. 22–24	Nov. 20–22	St. Petersburg, Fla.
Florida	Nov. 18–20	Nov. 16–18	Nov. 15–17	Nov. 22–24	Nov. 20–22	St. Petersburg, Fla.
Four States	Oct. 14–16	Nov. 8–10	Dec. 13–15	Sept. 26–28	Nov. 19–21	Washington, D.C.
Illinois	Apr. 8–9	Apr. 11–13	Oct. 30–31	——	Apr. 17–18	Chicago, Ill.
Indiana	Apr. 29–30	Apr. 13–14	June 12–22*	Apr. 2–3	May 7–9	Indianapolis, Ind.
Iowa	——	——	——	Nov. 4–5	Oct. 9–11	Cedar Rapids, Iowa
Kansas	——	——	——	Mar. 7–8	Mar. 13–14	Wichita, Kan.
Kentucky-Tennessee	——	——	June 4–5	Oct. 28–30	Sept. 22–24	Louisville, Ky.
Michigan	Apr. 20–22	Apr. 26–28	Sept. 19–20	Sept. 18–20	Sept. 18–20	Bay City, Mich.
Minnesota	Mar. 12–13	Mar. 16–17	Sept. 11–18*	Mar. 14–15	Mar. 13–14	St. Paul, Minn.
Missouri	——	——	——	Oct. 21–22	Oct. 27–28	Jefferson City, Mo.
Missouri Valley	Oct. 15–16	——	Oct. 29–30	——	——	
Montana	May 14–15	May 5–6	Apr. 13–14	Apr. 12–13	Apr. 25–26	Havre, Mont.
Nebraska	——	——	——	——	Apr. 11–12	Lincoln, Neb.
New England	——	——	——	Oct. 17	——	
New Jersey	Mar. 14	Feb. 10	Jan. 29	Mar. 1	Feb. 19	New Brunswick, N.J.
	Apr. 9	May 11	July 25	——	June 19	Boonton, N.J.
	Nov. 4–6	Nov. 2–4	Nov. 8–10	Nov. 7–9	Nov. 6–8	Atlantic City, N.J.
New York	Mar. 25–26	Apr. 27–28	Jan. 17	Mar. 28–29	Apr. 10–11	Buffalo, N.Y.
	Sept. 30–Oct. 1	——	May 22–25*	Oct. 3–4	Sept. 4–5	Plattsburg, N.Y.
North Carolina	Nov. 2–3	——	Nov. 5–7	Nov. 18–20	Nov. 10–12	Greensboro, N.C.
Ohio	Apr. 12	May 18–19	Oct. 23–26*	Oct. 10–12	Sept. 30–Oct. 2	Columbus, Ohio
Pacific Northwest	May 7–8	May 12–13	——	May 23–25	May 15–17	Victoria, B.C.
Rocky Mountain	Sept. 15–17	Sept. 20–22	Sept. 21	Sept. 12–13	Sept. 25–26	Denver, Colo.
Southeastern	——	May 8–10	——	Sept. 9–11	Nov. 3–5	Atlanta, Ga.
Southwest	Oct. 11–13	Oct. 17–19	Oct. 16–17	Oct. 14–17	Oct. 12–15	Amarillo, Tex.
Virginia	Nov. 22–23	Nov. 14–15	Nov. 8–9	Nov. 14–15	Nov. 17–18	Roanoke, Va.
West Virginia	Nov. 4–5	Oct. 26–27	Nov. 15–16	Oct. 17–18	Oct. 2–3	Bluefield, W.Va.
Western Pennsylvania	Sept. 23	——	Sept. 14	Sept. 12–13	June 12–13	Pittsburgh, Pa.
Wisconsin	Oct. 19–21	——	Nov. 13–15	Nov. 15–17	Oct. 23–25	Milwaukee, Wis.

* Regional meetings.

Section Membership at Time of, and Total Attendance at, Section Meetings—1943–1947

SECTION	1943		1944		1945		1946		1947	
	Membership	Attendance	Membership	Attendance	Membership	Attendance	Membership	Attendance	Membership	Attendance
Alabama-Mississippi	*	*	*	*	*	*	*	*	52	87
Arizona	*	*	*	*	*	*	*	*	26	134
California	589	915	638	926	663	503	684	857	726	§
Canadian	289	447	323	555	353	800	383	600	404	730
Cuban	36	†	34	†	38	‡	36	26	36	116
Florida	111	105	138	157	134	120	149	142	165	116
Four States	278	359	324	325	336	202	343	172	350	180
Illinois	282	142	293	126	330	219	353	‡	362	318
Indiana	175	200	202	221	206	386	203	226	206	224
Iowa	*	*	*	*	*	*	67	106	93	115
Kansas	*	*	*	*	*	*	55	107	93	132
Kentucky-Tennessee	117	‡	127	‡	129	†	131	98	132	133
Michigan	126	215	135	205	150	152	181	230	199	222
Minnesota	90	178	102	202	120	146	120	179	161	206
Missouri	*	*	*	*	*	*	154	†	149	195
Missouri Valley	201	124	228		294	166	254	§	¶	¶
Montana	46	71	53	82	57	43	59	78	61	69
Nebraska	*	*	*	*	*	*	*	*	35	†
New England	146	‡	154	‡	161	‡	170	57	172	‡
New Jersey‖	261	135	266	119	291	91	305	250	309	217
New York‖	509	194	510	†	526	332	575	126	627	230
North Carolina	160	202	155	‡	156	272	162	237	169	212
Ohio	205	122	255	261	267	†	332	†	336	251
Pacific Northwest	205	184	222	242	228	‡	267	234	267	234
Rocky Mountain	84	122	91	128	94	90	103	84	117	92
Southeastern	198	‡	217	274	231	‡	238	179	151	136
Southwest	266	390	328	573	359	211	434	430	557	428
Virginia	97	166	113	160	122	175	125	219	146	201
West Virginia	65	130	75	117	76	†	80	131	82	120
Western Pennsylvania	142	160	147	‡	152	155	159	115	157	132
Wisconsin	117	228	125	‡	129	255	133	272	138	302

* Section not then organized.

† No record of attendance.

‡ No regular meeting scheduled. Membership given as of dates of conferences for 1941–1944, 1946, and as of June 30, 1945.

§ Regular meeting cancelled. Business meeting held at annual conference.

‖ Only one meeting recorded here.

¶ Section discontinued.

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NEWS OF THE FIELD

Blue Sky Sanitary Engineering is a term that appears to apply properly to certain advertising, publicity and even editorial copy which has appeared in the last year or so.

For example, one manufacturer recently carried a full page color ad in a business publication of nation-wide distribution, which carried the tag line "How Wooden Pipes Saved a City." The text of the ad included the following sentences:

> When Yellow Fever swept New York City in 1798, killing hundreds of people, the epidemic was traced to polluted water. . . . Pine logs, bored and laid end to end, piped water from wells to homes, where lead lines tapped the mains. This was New York's first water system, a "life line" that ended yellow fever.

These sentences are interesting—but they are not true. Persons having more than a primary knowledge of epidemiology have known since the magnificent work done by Walter Reed and his associates that yellow fever is a mosquito-borne infection and that pollution of drinking water has nothing to do with it. Mosquitoes will breed in polluted or unpolluted water, and the principal way to get rid of yellow fever is to keep them from breeding. The second sanitary engineering error in fact is the statement that the early New York City water system "ended" yellow fever in New York. Yellow fever was recurrent in New York for many years after these water pipes were laid. There was a serious epidemic in 1822 and one that was statistically noticeable in 1870.

Within the last few weeks, a national institution in the field of business circulated a public release which, although cleverly phrased, is capable of giving the untrained reader the idea that certain methods of chlorination of water have a definite relationship to the control of poliomyelitis. The all too frequent tendency on the part of propagandists to overreach themselves in their discussions of polio was officially noted in the August 1946 issue of the *American Journal of Public Health* in a striking editorial which bore the title "Panic or Reason in Dealing With Poliomyelitis?" The editor, in commenting on what he calls the "half-truths of scientific research," states in the words of the professional epidemiologist that:

> The evidence which has been accumulated . . . has tended to establish the concept that poliomyelitis is exclusively a human infection and that the virus is passed rather directly from an infected person to a non-infected susceptible individual. . . . Although epidemics of poliomyelitis have been carefully investigated by numerous epidemiologists over many years, there is no record of this disease having been spread by a common water supply.

(Continued on page 2)

(*Continued from page 1*)

Although the water works engineer appreciates the desire of the manufacturers and their advertising agents to pay tribute to his achievements in improving water supply quality, he prefers to be credited with facts and not with fancies.

Along with the rest of the New Year's resolutions which will usher in 1947, one very wise one for advertising agencies and public relations men to include in their list is to avoid *Blue Sky* statements in sanitary engineering publicity. Such statements tend to retard the real advances in public health engineering.

The soda-ash shortage is world-wide, according to a detailed statement by C. C. Concannon, Chief of the Chem. & Drug Div. of the Dept. of Commerce. Outlining the skyrocketing demands and the various reasons why U.S. production has dropped below its 4,718,000-ton peak in 1944, Concannon pointed out that the same situation prevailed in other countries, so that there is no hope of relieving the situation by imports. Although expansion of facilities for production have been handicapped by material and construction restrictions, a number of new facilities to cost $3\frac{1}{3}$ million have already been approved by the CPA.

Clinton Inglee, President, National Water Main Cleaning Co., well known to all Association members, died at Amityville, Long Island, on December 21, 1946, after a year's illness. He was 59 years of age.

A water transfusion through $1\frac{1}{2}$ miles of firehose enabled the West Terre Haute, Ind., Water Works to keep its customers supplied throughout the crisis which developed when both its pumps broke down at the same time. The donor was the neighboring community of Terre Haute, whose supply was tapped at the nearest hydrant

"Fire and the Air War," edited by Horatio Bond, Chief Engr., National Fire Protection Assn., is a collection of "now-it-can-be-told" articles by the experts who scientifically planned the reduction of enemy cities by fire in World War II. It contains, too, the complete text of the official report of the U.S. Strategic Bombing Survey on the atomic bombings of Hiroshima and Nagasaki. All in all, its 276 pages and 161 illustrations are an important, if rather demoralizing, record of the role of fire as an offensive weapon of warfare.

Published by the National Fire Protection Assn., the book tells its story from the viewpoint of fire protection engineers and professional firemen, who attempt to tie together the fire lessons of the war with the fire protection practices of peacetime. The book is available through the NFPA office at 60 Batterymarch St., Boston, Mass., at a cost of $4.00.

(*Continued on page 4*)

Newest

LEAK CLAMP

(FLEXIBLE PIPE REPAIR CLAMP)

offers these advantages

1. **EASIER TO INSTALL**
   50% less bulk than some older types makes it easier to install.
2. **MORE FLEXIBLE**
   Band is flexible and conforms to any shape or irregularities of the pipe.
3. **BETTER SEALING**
   Due to uniformly snug fit of copper band and gasket.
4. **SAFEST**
   Lugs do not exert collapsing pressure on thin walled or weakened pipe.
5. **ALMOST 100% WRAP-AROUND**
   Unique Smith-Blair method of anchoring band to clamps gives maximum wrap-around.

ENDURING...
as the pipeline itself!

Furnished complete with rubber gasket and zinc plated bolts for ½ through 24-inch outside diameters. For use on standard, riveted, O. D., cast iron, or asbestos-cement pipe. Band widths 1⅛ to 30-inches in multiples of 3-inches. When ordering specify O. D. of pipe—width band wanted—and if for low, medium or high-pressure lines.

Smith-Blair, Inc.
Water Works Supplies and Specialties
SOUTH SAN FRANCISCO • CALIFORNIA

Several exclusive distributor territories available. Write for details.

Immediate Delivery!
Order from Distributor Stock

ARIZONA
Phoenix, *Crane Co.*
Tucson, *Crane Co.*
ARKANSAS
Fort Smith, *Crane Co.*
CALIFORNIA
Los Angeles, *Crane Co.*
" *Santa Fe Pipe & Supply Co.*
" *Western Water Works Sup. Co.*
Sacramento, *Dallman Supply Co.*
Santa Ana, *Crane Co.*
CALIFORNIA—continued
San Bernardino, *Crane Co.*
San Francisco, *Dallman Supply Co.*
San Diego, *Industries Supply Co.*
COLORADO
Denver, *Thompson Pipe & Steel Co.*
IDAHO
Salt Lake City, *Waterworks Equip. Co.*
KANSAS
Kansas City, *F. L. Carswell Mfg. Co.*
LOUISIANA
Shreveport, *Viking Supply Co.*
MISSOURI
Kansas City, Kans., *F. L. Carswell Mfg. Co.*
MISSISSIPPI
Jackson, *Viking Supply Co.*
NEBRASKA
Lincoln, *Western Supply Co.*
OKLAHOMA
Oklahoma City, *Crane Co.*
Tulsa, *Crane Co.*
OREGON
Portland, *Waterworks Supply Co.*
TENNESSEE
Memphis, *Viking Supply Co.*
TEXAS
Waco, *The Rohan Co.*
UTAH
Salt Lake City, *Waterworks Equip. Co.*
WASHINGTON
Seattle, *Marchmann & Williams*

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

(*Continued from page 2*)

Curtailment of Congressional appropriations for public works projects has necessitated drastic reductions in personnel and other economies to permit continuance of construction on the major Corps of Engineers projects of the comprehensive river development program in the Missouri River basin (*see* Jour. A.W.W.A., **38**: 859 (1946)). Brig. Gen. Lewis A. Pick, Missouri River Div. Engr., has pointed out that the expenditure limitation would necessarily slow down the projects under construction, but expressed the hope that it would not be necessary to halt work entirely on any of the contracts.

The new expenditure ceiling will force deferment of planning for the construction of major structures at the main stem dams, on which initial work has started, and of the planning preparatory to construction of the agricultural levees. It also eliminates the possibility of letting further contracts during the remainder of the fiscal year and will thus probably throw the entire valley program at least a year behind schedule.

Joseph C. Knox, Sr. San. Engr., Massachusetts Dept. of Public Health, has been appointed Secretary of the New England Water Works Assn. An active member of the organization since 1933, Knox served on many of its committees and was Chairman of the Technical Program Com. for four years. In 1945 he was elected to the Board of Directors.

Knox began his engineering career with the Massachusetts Dept. of Public Health in 1920, with the first surveying party on the Quabbin Reservoir study and is now in charge of special legislative investigations, including studies of water supply needs and resources, under direction of the Chief San. Engr. He was graduated from the Harvard Graduate School of Eng. with the degree of Master of Science in San. Eng.

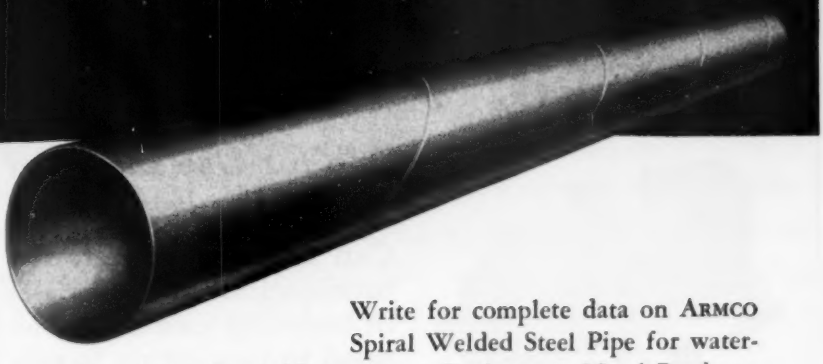
During the war Knox served on the staff of the Adjutant General of Massachusetts in connection with the protection of water utilities and coordination of water supply materials and personnel. He also served as Tech. Adviser in matters of water supply to the State Com. on Public Safety.

From the Philippines, J. C. Perlas, Chief Engr. of the Manila Metropolitan Water Dist., reports that a tremendous task of reconstruction and rehabilitation faces his organizaion, which was one of the worst war-damage sufferers. He estimates that the limited funds available and the scarcity of construction materials will delay full-scale operations for another five years.

Perlas was recently appointed to his position of Chief Engr. by the president of the new republic to take the place of Gregorio de Leon, a victim of the Japanese massacre of civilians which attended the battle of liberation.

(*Continued on page 6*)

LONG LENGTHS* and Special Fittings Save Time, Money, WHEN YOU USE ARMCO STEEL PIPE



Write for complete data on ARMCO Spiral Welded Steel Pipe for waterworks systems. Just address Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 3365 Curtis St., Middletown, O.

*Lengths up to 50 feet, special prefabricated fittings of all kinds. Diameters 6" to 36", wall thicknesses 7/64 to 1/2-inch.

ARMCO STEEL PIPE

MEETS A.W.W.A. SPECIFICATIONS

ARMCO

(*Continued from page 4*)

Arthur N. Beck has been appointed Chief Engr. and Director of the Bureau of Sanitation, Alabama State Dept. of Public Health, to succeed Thomas H. Milford who was killed in an automobile accident November 2. Beck will take over his new responsibilities with a background of many years of service with the bureau as Asst. San. Engr.

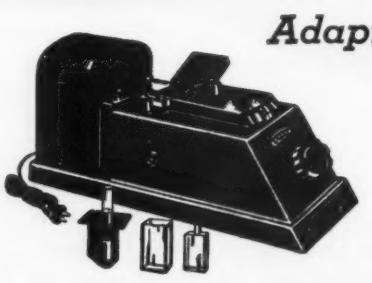
Laboratorians will be interested in reading an article on "How to Prevent Accidents in the Laboratory," which appeared in a recent issue (Vol. 16, No. 3) of *The Laboratory*, publication of the Fisher Scientific Co., Pittsburgh, and Eimer & Amend, New York. In addition to outlining accident-preventing techniques, the article describes the various safety equipment available to protect personnel against laboratory hazards.

A job opportunity for someone interested in selling chlorine-feed apparatus, filters and similar equipment on an exclusive territory basis recently came to the attention of A.W.W.A. headquarters. The manufacturer, an Associate Member, caught us suggestionless. If you have an idea or an interest, send your suggestion or application to the JOURNAL, attention Managing Editor.

(*Continued on page 8*)

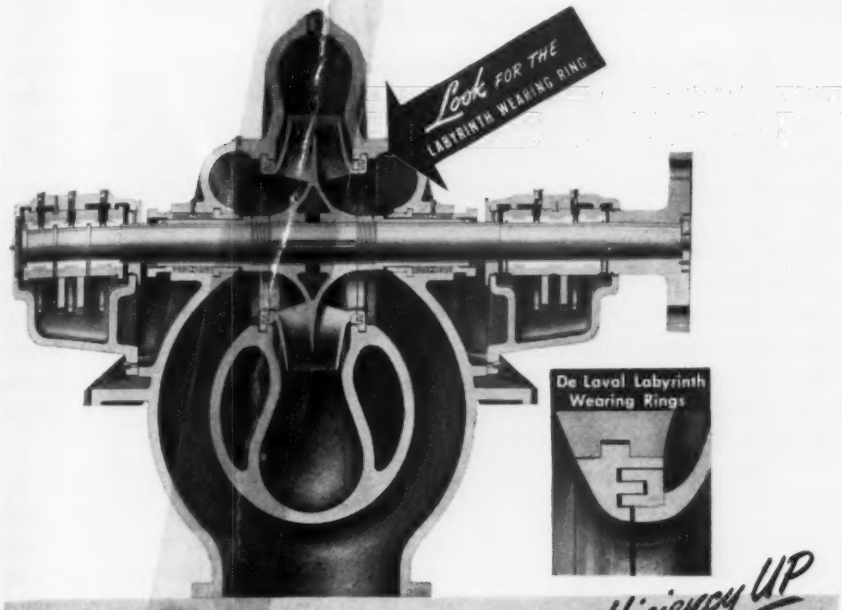
KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

KLETT MANUFACTURING CO.
179 EAST 87th STREET · NEW YORK, N. Y.



DE LAVAL LABYRINTH RINGS *keep efficiency UP cost DOWN*

De Laval Labyrinth Wearing Rings minimize leakage from discharge back to suction. The sealing action of these rings is accomplished by the use of large clearance, tortuous labyrinth passages and does not depend upon close mechanical clearances, such as required for plain flat rings. Because of the larger clearances and reduced flow, the effectiveness of the De Laval labyrinth ring is but little diminished by wear, resulting in sustained efficiency for long periods. When selecting pumps for lowest ultimate cost, look for the De Laval Labyrinth Wearing Ring.

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

(*Continued from page 6*)

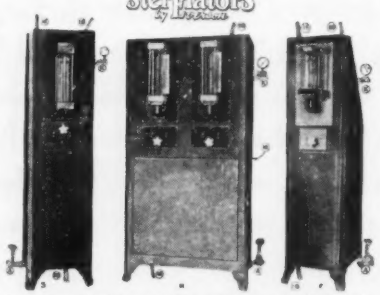
William T. Ingram, Lt. Col., U.S. Public Health Service, has been appointed Engineering Field Associate by the executive board of the American Public Health Assn. to undertake an investigation of the problems related to sanitary and public health engineering with a view toward: (1) more adequate provision of needed personnel employed in the sanitation of the environment; (2) establishing the engineer in a position of greater usefulness to the administrator; (3) developing sanitary and public health engineering as professional careers offering attractive opportunities to young men now entering colleges and universities; (4) stimulating universities to the expansion of undergraduate and graduate curricula which will prepare the student for his professional engineering role; and (5) improving and broadening the environmental health services in all of the functional fields in keeping with state and community requirements.

This field project, which has been underwritten for a period of two years by the National Foundation for Infantile Paralysis, through funds from their "March of Dimes" program, and by a group of sanitary engineering industries, was established as a direct result of the report on "Local Health Units for the Nation," by Dr. Haven Emerson and committee, which pointed out that there is a need for more than a thousand public

(*Continued on page 10*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

SterFlators by Everson



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson Ste:Elators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

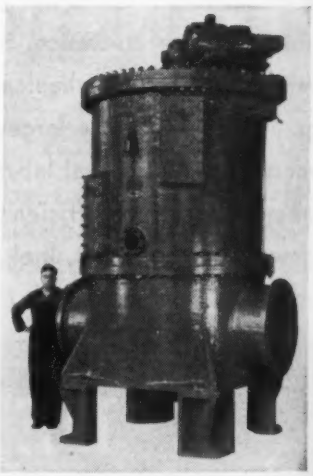
Eve-son SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

SterFlators by Everson

EVERSON MANUFACTURING COMPANY
214 West Huron Street, Chicago 10, Illinois

BRASSERT STRAINERS
AUTOMATIC . . SELF-CLEANING



S. P. KINNEY ENGINEERS
233 OLIVER AVENUE PITTSBURGH 22, PA.

Gravity Pressure in Soledad

The installation of the 100,000 gal. elevated water tank shown above rounds out the complete modernization of the water system in Soledad, Calif., since it was purchased from private owners in 1930. The tank provides gravity water pressure in the mains serving a population of 1500. Write our nearest office for estimating figures on elevated tanks for any waterworks improvements you are designing.

CHICAGO BRIDGE & IRON COMPANY

BIRMINGHAM CHICAGO TULSA CLEVELAND
PHILADELPHIA NEW YORK DETROIT WASHINGTON
SAN FRANCISCO HOUSTON ATLANTA LOS ANGELES

(*Continued from page 8*)

health engineers to meet even minimum requirements in the field of environmental health. Ingram is particularly well qualified to conduct this program. He has behind him a wide range of experience, including design, construction, surveying, stream pollution investigation and works maintenance, with public health experience at local, state, national and international levels through his service with the San Joaquin Local Health Dist., the state of California, the U.S. Public Health Service and the UNRRA.

A slide rule and correction factor curves for the direct mechanical solution of such open channel flow factors as water depth, slope, width of channel, discharge quantity, velocity of flow and coefficient of roughness, as defined by the Manning or Kutter formulas, have been developed by Charles H. Monett, City Engr. with U.S. Engr. Dist., Los Angeles.

The slide rule is based on an adaptation of the Manning formula, in which the water depth factor has been substituted for the hydraulic radius. When the ratio of channel width to water depth is larger than 50, no correction is necessary. Ratios below 50 are readily corrected by means of the graphs and correction curves, which have been adjusted so that a direct multiplication or division of the factor by the slide rule result gives the desired answer.

The slide rule and booklet of correction factor curves and instructions, which are all the equipment required for the solution of a wide range of problems, are available at a price of $3.00 direct from Mr. Monett, 300 S. Carmelina Ave., Los Angeles 24, Calif.

Thomas Hodkinson, Supt. of Water Works, London, Ont., retired from his position on December 1, after 42 years in the service of the city's Public Utilities Com. At a testimonial dinner celebrating the event, Hodkinson was presented with gifts and many tributes by his fellow employees. He has been an Active Member of the A.W.W.A. since 1913.

(*Continued on page 12*)

NATIONALLY APPROVED APPLICATORS OF ANTI-RUST AND ANTI-CORROSIVE COATINGS FOR ELEVATED TANKS, STAND PIPES, PENT STOCKS AND OTHER WATER WORKS INSTALLATIONS. **NO-OX-ID, BARRETT'S** AND OTHER APPROVED PROTECTIVE COATINGS APPLIED BY EXPERTLY TRAINED MEN.

W. A. BRIGGS BITUMEN Co.

FREE LITERATURE

3303 RICHMOND ST., PHILADELPHIA 34, PA.

New York Representative, telephone Chelsea 2-1676—Alfred Conhagen, Inc., 429 W. 17th St., N.Y.C.

SIMPLEX PITOT EQUIPMENT

For LOW COST, ACCURATE WATER SURVEYS

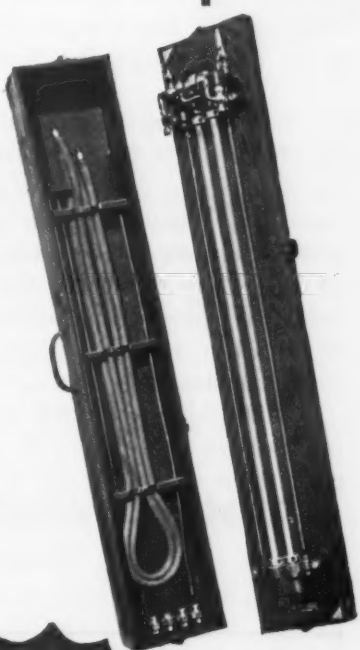
Water Waste Surveys • Pump Discharge Checks • Plant Test Work

The Simplex Pitot Rod, Manometer and Pitot recorder are specifically designed for all tests or surveys, where flow of water is concerned. These units are portable and yet ruggedly designed to withstand the continual movement from station to station.

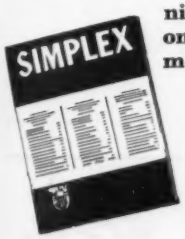
The modern streamlined, Type PF Pitot Rods are now available in standard lengths of 1′8″, 2′6″, 3′6″, 5′0″ and longer if required to accommodate any diameter of pipe encountered in modern industrial plants.

Normally the Simplex Outfit #1, consisting of the Pitot Rod and Manometer, is all that is required for a comprehensive water waste survey. The portable Type MLC Recording Instrument is available for those who require a permanent record. 8″ diameter, even-spaced, circular charts are employed with this recorder.

Simplex Valve and Meter Co. has had long experience in conducting water waste surveys and offers this modern line of survey equipment as the finest and most economical unit for this purpose.



We will be pleased to furnish additional information on the use of this equipment.



For descriptions and full operating instructions — write for Bulletin 50.

SIMPLEX VALVE & METER CO.

6784 UPLAND STREET • PHILADELPHIA 42, PENNA.

(*Continued from page 10*)

Thomas H. Milford, Chief Engineer and Director of the Bureau of Sanitation, Alabama State Health Department, was killed in an automobile accident in Montgomery, Ala., on the night of November 2. He was 43 years of age.

Upon his graduation from Texas A & M College with a civil engineering degree in 1926, Milford went to work with the Alabama State Health Department as an assistant sanitary engineer. He held this position until 1932, when he resumed his education at Harvard University. Upon earning his master's degree in sanitary engineering he was associated with the J. W. Goodwin Engineering Co. of Birmingham, Ala., for some time, returning to the State Health Department in August 1942.

Milford became a member of the Association in 1938 and has been active in Southeastern Section affairs.

Horace B. Gulden became Borough Mgr. of Lewistown, Pa., last September 1, upon his return to civilian life from three years of service in the Navy Civ. Eng. Corps. Prior to his military service Gulden was Mgr. of the State College, Pa., Water Works and Borough Engr. for 4 years.

S. P. Kinney Engineers, Inc., of Pittsburgh, which took over the equipment end of H. A. Brassert & Co. in 1942, is now preparing to enter the water works field on a large scale. Distributors of the Brassert Automatic Self-Cleaning Strainer, a machine for removing fine suspended particles from water and disposing of them in a continuous, automatic and self-cleaning manner, the company now has a large number of installations in industrial plants. At Houston, Tex., too, the Water Dept. uses a battery of two 24-in. and eight 12-in. units for the removal of sand from its well water supplies.

The strainer equipment is available in 3-in. to 30-in. pipeline sizes and of capacities for straining from 100 to 32,000 gpm. Complete details regarding the equipment and its use are available from the company's office at 233 Oliver Ave., Pittsburgh 22, Pa.

(*Continued on page 14*)

COOK Well Strainers

A reciprocal relation, the life and functioning of the one depending much on the other.

A. D. COOK, INC.

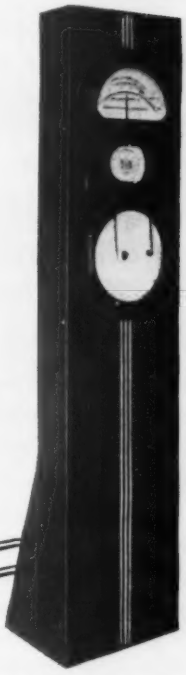
Lawrenceburg - Indiana

COOK Deep-Well Turbine Pumps

Accurate . . . Trouble-Free

MAIN LINE METERING

After more than thirty years of service many Builders Type M Instruments and Venturi Tubes are still on the job, metering with original accuracy. The Type M Register-Indicator-Recorder furnishes complete information: a continuous indication of flow, a permanent record on a 12" chart and the total quantity on a counter dial — all within an accuracy of plus or minus 2% over a flow range as wide as 15 to 1.



Builders Type M Instrument

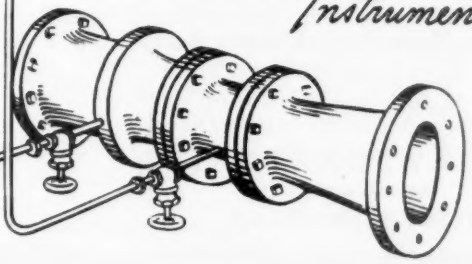
The Builders Venturi Tube has no moving parts in the pipe line — nothing to wear out — and the pressure loss is extremely low. Only two small pipes are required to connect the Register-Indicator-Recorder. The Venturi Tube is a complete unit, precisely machined and assembled at the factory — with heavier than usual construction throughout for greater strength and durability. For Bulletin 293C, address Builders-Providence, Inc., (Division of Builders Iron Foundry), 25 Codding St., Providence 1, Rhode Island.

BUILDERS PRODUCTS

Venturi, Propeloflo and Orifice Meters • Type M and Flo-Watch Instruments • Venturi Filter Controllers and Gauges • Master Controllers • Kennison Nozzles • Chronoflo Telemeters • Conveyor Scales

BUILDERS-PROVIDENCE

Instruments



Builders Venturi Meter Tube

(*Continued from page 12*)

Philadelphia's ten-million-dollar water treatment plant rehabilitation program will include the largest installation of ozonation equipment in the U.S. The equipment, which is to be supplied by Ozone Processes, Inc., will have a producing capacity of 1,250 lb. of ozone to treat 36 mgd., applying the ozone to the raw water ahead of coagulation and filtration to oxidize soluble taste-, odor- and color-producing impurities.

The installation, which is to be based on extensive pilot plant tests by City Water Bureau engineers over the past two years, is expected to be in full operation by 1948.

Smith-Blair, Inc., South San Francisco, Calif., has introduced a new pipe leak repair clamp, which the company claims makes the sealing-off of leaks quick and as permanent as the line itself. Clamps now being produced are for all types of metallic and asbestos-cement pipe of sizes from ½ to 30 in. in diameter.

The clamp has a copper band sleeve which gives about 100 per cent wrap-around without using a "tongue" and has cast lugs which can be reduced in length for 30-in. sleeves down to 3-in. sleeves in multiples of 3 in., without special tools.

(*Continued on page 16*)

DIFCO

Culture Media Ingredients

This group of Difco Products is prepared expressly for use as ingredients of bacteriological culture media. Each product is carefully tested and standardized to meet the most rigid requirements of usefulness for the purposes for which it is to be employed.

Bacto-Beef Extract, approved in "Standard Methods of Water Analysis."

Bacto-Peptone, also approved in "Standard Methods."

Bacto-Oxgall, especially recommended for preparation of bile media.

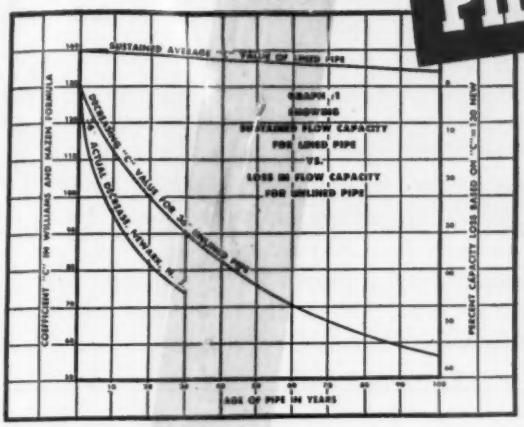
Bacto-Lactose, a highly purified product recommended for use in many media for presumptive detection of coliform bacteria.

Certified Dyes, for use in culture media, include Bacto-Basic Fuchsin, Bacto-Brilliant Green, Bacto-Crystal Violet, Bacto-Eosin Y and Bacto-Methylene Blue.

Specify "DIFCO"

DIFCO LABORATORIES
INCORPORATED
DETROIT 1, MICHIGAN

PIPE LINING


SUSTAINED AVERAGE "C" VALUE OF LINED PIPE
GRAPH #1 SHOWING SUSTAINED FLOW CAPACITY FOR LINED PIPE —VS.— LOSS IN FLOW CAPACITY FOR UNLINED PIPE
DECREASING "C" VALUE FOR 30" UNLINED PIPE AS ACTUAL DIAMETER INCREASES
COEFFICIENT "C" IN WILLIAMS AND HAZEN FORMULA
PERCENT CAPACITY LOSS BASED ON "C" = 130 MEAN
AGE OF PIPE IN YEARS

CONSERVE YOUR WATER MAIN INVESTMENT BY MAINTAINING MAXIMUM LONG TERM FLOW CAPACITY

The economic value of a water main is dependent on sustained maximum Revenue-Producing Flow Capacity

It is not enough to evaluate water main investments solely in terms of the long term external structural life. Have you ever seen the inside of your important supply mains? Most lines are in good structural condition after many years of service. But what of the loss in fire fighting and operating pressures, in increased pumping costs, in reduction of revenue-producing output — all due to decreased flow capacity caused by corrosion, tuberculation and incrustation?

The chart above shows a comparison of the sustained flow capacity in cement lined pipe and the losses in flow capacity of unlined pipe. The sober conclusion is unmistakable. Unlined pipe for water mains is technically unsound and financially disastrous.

If you have water mains over 30 inches in diameter, THE AUTOMATIC PRELOAD CEMENT LINING AND TROWELING MACHINE can restore the original flow capacity, (and possibly increase it beyond the original capacity in the case of old fully rivetted plate pipe lines).

Write for our new PIPE LINING Bulletin

THE **PRELOAD** CORPORATION

420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

Boston — New York — Chicago — Washington — St. Louis — Mexico City — Bogota, S. A.

In Canada

AQUEDUCT ENGINEERING LIMITED
679 Belmont Street, Montreal
Toronto, Ont. Halifax, N. S.

PRELOAD

PIPE LINING ENGINEERS

Designers and Builders of Prestressed Concrete Structures, Prestressed Concrete Storage Tanks and Pressure Pipe

(*Continued from page 14*)

George Graham Routledge, Engineer in Charge of Water Distribution for the City of Toronto, Ontario, died on October 23, at the age of 76.

A native of England, Routledge received his training and early experience with the British Government, serving as engineer on a number of projects of the Ordnance Survey Plan throughout the British Isles. From 1889 until 1912, when he went to Canada, he served as assistant engineer in the city engineer's office of Paisley, Scotland. At the time of his death, he had supervised the Toronto water distribution system for more than 30 years.

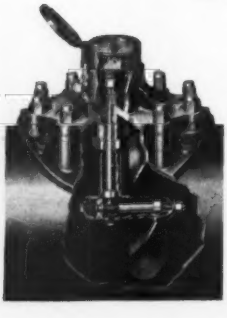
A member of the Association since March 1919, Routledge was awarded the Canadian Section Hunt Memorial a few years ago in recognition of his outstanding service in water works engineering.

Liquid Conditioning Corp. has issued a new 60-page handbook describing the most advanced and modern methods and apparatus for conditioning water and other liquids. The catalog, which explains the applications, advantages and limitations of each type of conditioning process, includes numerous tables listing the various kinds of gaseous and solid impurities, showing the effects, limits of tolerance for different purposes, methods of removal and residual amount of each impurity after treatment and a comparison chart showing the chemical results produced by water treatment methods. Included also are 37 diagrams showing the principles of construction and operation of the various processes and equipment for softening, clarification and demineralization.

Plant executives and engineers can obtain copies by writing, on their business letterhead, to Liquid Conditioning Corp., 423 W. 126th St., New York 27, N.Y., requesting Bulletin G.

(*Continued on page 20*)

SPARLING MAIN-LINE METERS



The Direct Action meter that has given SERVICE and SATISFACTION for over 27 Years.

Bulletin 309 comes upon request

R. W. SPARLING

Manufacturer of Water Measuring Equipment

LOS ANGELES · CHICAGO · CINCINNATI · NEW YORK

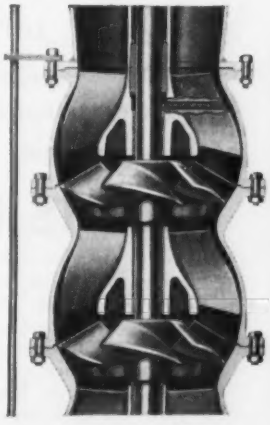
PEERLESS PUMPS

PEERLESS
Hydro-Foil PUMPS
Move huge volumes of water against low and medium heads

To rapidly move and remove maximum amounts of water
— PEERLESS MIXED-FLOW PUMPS

The most modern principles of aero and hydro-dynamic design are embodied in Peerless Mixed-Flow pump construction, attaining new high efficiencies in large volume water lift and lowering overall maintenance and pumping costs.

Numerous successful applications of Peerless Mixed-Flow Pumps include: drainage; sewer and flood control service; de-watering; irrigation water diversion; flooding of agricultural lands; industrial and process work including condensers, circulation of liquors, etc.



PEERLESS MIXED-FLOW PUMPS
CAPACITIES: UP TO 220,000 G.P.M.
Cutaway view of Mixed-Flow multi-stage pump impeller and bowl construction revealing high efficiency impellers used for more economical lift.

PEERLESS PUMPS
PEERLESS PUMP DIV. FOOD MACHINERY CORP.
Los Angeles 31, Calif.; Canton 6, Ohio; Quincy, Ill.
FACTORY BRANCHES: ARDMORE, PA.; DECATUR, ILL.; ATLANTA, GA.; DALLAS, TEXAS
DISTRIBUTORS PRINCIPAL CITIES

PROPELLER TYPE PUMPS

Peerless pumps, embodying the Hydro-Foil principle, are also available in the propeller type and are capable of handling identical capacities of the Peerless mixed-flow pump. Request Bulletin B-148 on design, construction and application data of these two outstanding types of Peerless Pumps, for large-volume pumping.

C. I. P. CENTURY CLUB

WILMINGTON, NEWARK, BOSTON

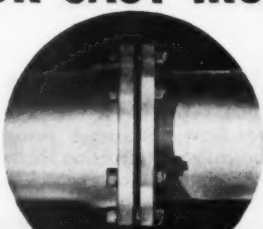
This year, according to our records, the above named cities, having cast iron mains now in their 100th year of service, are eligible to join the growing group of municipalities already members of the Cast Iron Pipe Century Club. There are no dues, nor any obligation other than to inform us if the qualifying main is taken out of service, or, sold for re-use in another city. Incidentally, the membership outlook for C. I. P. C. C. is promising since many cities have some or all of their original cast iron mains in service, a number of them within hailing distance of the century mark.

Large cities do not keep inefficient mains in service, however old, for sentiment's sake. Cast iron water mains, laid a century or more ago, still function in America's largest cities because they offer additional years, generations, or even centuries, of efficient life. This is what we mean by *efficient* life:

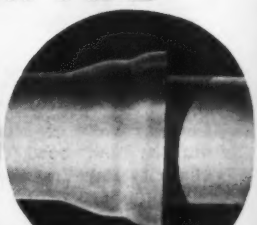
"Cast iron pipe not only offers a century or more of efficient life as a struc-

JOINTS FOR CAST IRON PIPE

A variety of joints are available of which the two most widely used are here illustrated. Special-purpose joints, such as the Ball-and-Socket or Flexible Joint for underwater use, and the Flanged Joint for above-ground use, are also available.



Mechanical Joint — bottle-tight and flexible, now with interchangeable parts.



Bell-and-Spigot Joint — still the standard joint for water and sewerage service.

CAST IRON PIPE

GAINS 4 NEW CITIES

PROVIDENCE

ture—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

No other pressure pipe material, either on past performance or engineering estimates of performance, comes anywhere near to approaching the combined long life and sustained carrying capacity of cast iron pipe.

PUBLIC WATER SUPPLY — the Forgotten Industry

The public takes piped running water for granted—until it's turned off. A good public water supply is not news—except on the rare occasions when something goes wrong. To help create public awareness of the service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* influential readers of "Time" and "Nation's Business." For instance, the following excerpts and illustration from a current advertisement.

"rowboats on fifth avenue"

"Imagine enough water to cover Manhattan Island's 22 square miles with a knee-deep flood. That's what the thirty-three million tons of water delivered daily by America's public water supply systems would do.

"Based on weight of product, processed and delivered, public water supply is America's largest industry. In *three days,* this indispensable industry delivers more tons of water than the tonnage produced by the steel industry in a *year!*

"A good water supply should not be unappreciated or taken for granted. It is the result of farsighted planning and faithful, efficient operation 24 hours a day, every day in the year."

Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

SERVES FOR CENTURIES

(*Continued from page 16*)

Lincoln Van Gilder, Engineer and Superintendent of the Atlantic City, N.J., Water Department, died November 15, at the age of 86, after an illness of several months.

Following his education in public schools, Van Gilder left New Jersey at the age of 18 to enter the lumber business in North Carolina. He returned to his native state in 1906 to become superintendent of the Atlantic City Water Department and held that position continuously until his death.

Van Gilder, who is believed to have been one of the oldest municipal employees of New Jersey, was also one of the senior members of the Association, having become an Active Member in 1906. In 1940, he was presented the New Jersey Section's George Warren Fuller Award for his distinguished service in the field of public water supply.

Robert H. Reece recently accepted a position as Instructor in Mech. Eng. at California Polytechnic, San Luis Obispo, Calif., upon his release from the Navy. In service for 3½ years, Reece served as navigator of the U.S.S. Lubbock, APA 197, of the 7th Amphibious Force, taking part in the D-day landings on Iwo Jima and Okinawa.

Atlas Mineral Products Co., Mertztown, Pa., has announced the formation of an affiliate organization—Atlas Mineral Products Co. of Texas, Inc., Box 252, Houston 1, Tex. The new affiliate, which includes a manufacturing plant for sulfur cements and other firm products, will handle sales of Atlas products in the territory west of the Mississippi, excluding Minnesota, North Dakota and Eastern Missouri, and in western Tennessee, Mississippi and Louisiana.

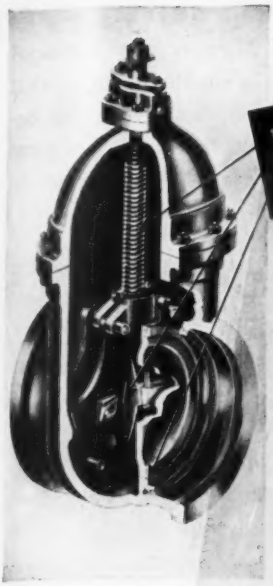
(*Continued on page 22*)

ZECO GREENSAND ZEOLITE

ZECO and HI–ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.

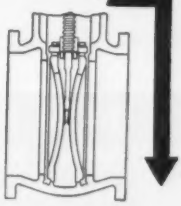
90 WEST STREET **NEW YORK 6, N. Y.**



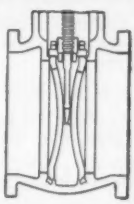
1. Continued turning of valve stem
2. Brings wedges into action and expands the discs against their seats
3. After disc travel ceases.

Why SMITH GATE VALVES DO NOT WEDGE PREMATURELY

All the Way DOWN



and then OUT



Because of its unique side wedging action, the discs of a Smith Gate Valve are not expanded laterally until after they have completed their travel and fully cover the ports. Termination of the discs' travel and further turning of the valve stem actuates the wedges and expands the discs. In opening, the action is reversed, the wedges are fully released before the discs commence to travel to an open position.

Smith Gate Valves are made in all types and sizes for manual, hydraulic cylinder, or motor operation and for low—medium—high pressure services.

18

FIRE HYDRANTS
GATE VALVES
CHECK VALVES
INSERTING VALVES
TAPPING SLEEVES AND VALVES
WATER SERVICE BRASS GOODS

THE A. P. SMITH MFG. CO.

EAST ORANGE, NEW JERSEY

FLOOR STANDS
INDICATOR POSTS
TAPPING MACHINES
INSERTING MACHINES
PIPE CUTTING MACHINES
CORPORATION TAPPING MACHINES

(*Continued from page 20*)

J. A. Frank, formerly Chief Engr. & Field Mgr. of the National Water Main Cleaning Co., New York, was elected Vice-President of that company as of Nov. 1, 1946. In assuming his new duties, Frank has behind him a record of "growing up" in the organization from his original job as engineer. A mechanical engineering graduate of Stevens Inst. in 1933, Frank holds a license as professional engineer in New Jersey.

Henry E. Thompson has left his post as Director of Utilities at the Univ. of North Carolina after nine years' service to accept an appointment as Supt. of the Washington, N.C., Municipal Water Dept.

Robert P. Lowe recently resigned his position as San. Engr. for the War Relocation Authority, after 3½ years service, to become Dist. San. Engr. with the newly-formed Allegheny County Sanitary Authority, Pittsburgh. In his new position, he will supervise the gaging and field testing of sewers and the investigation of industrial wastes in the area as part of the Authority's detailed and comprehensive survey of sewage and industrial waste collection, treatment and disposal.

(*Continued on page 24*)

WATER REFINING
EQUIPMENT HEADQUARTERS
INDUSTRIAL—PROCESS
RAILROAD—MUNICIPAL—HOUSEHOLD

FILTERS Of All Types *and* Capacities . . . Gravity . . . Pressure
SOFTENING SYSTEMS
All Types *and* Capacities—Zeolites (*synthetic and natural*) and Lime and Soda
CHEMICAL FEEDERS (wet or dry)
Acids . . . Hypochlorites . . . Alkalies
EQUIPMENT FOR REMOVAL
Of Iron . . . Taste . . . Odors . . . Colors . . . Suspended Matter
SWIMMING POOL EQUIPMENT
AERATORS · DE-GASIFIERS
WATER TEST SETS
RE-CARBONATORS

The AMERICAN WATER
SOFTENER COMPANY
WATER REFINING EQUIPMENT HEADQUARTERS
INDUSTRIAL · PROCESS · RAILROAD · MUNICIPAL
HOUSEHOLD
322 LEHIGH AVE., PHILA., PA.

M H

HIGH QUALITY
VALVES
HYDRANTS

M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

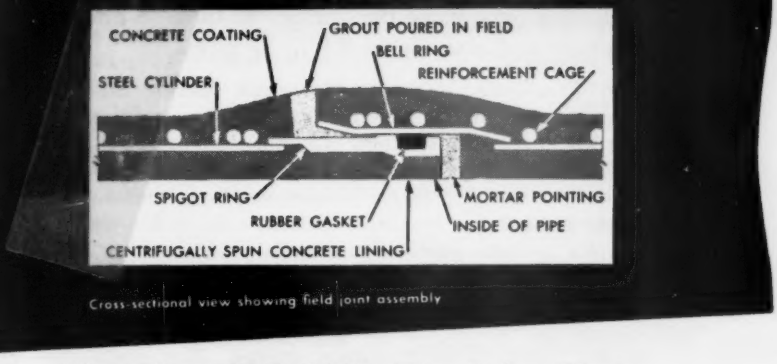
DEVELOPED BY

American PIPE & CONSTRUCTION CO.

LONG-LASTING WATER SUPPLY LINES

AMERICAN CONCRETE CYLINDER PIPE

with the Lock Joint Rubber Gasket Joint



Cross-sectional view showing field joint assembly

Nearly 500,000 Feet in Use

High strength, durability and maximum carrying capacity! Ease and simplicity of installation! Low cost! These advantages of American Concrete Cylinder Pipe are being proven in installations throughout the West.

Sixteen years ago the company began development of this new type of pipe for small and medium diameter needs. Now available in diameters from 16″ upwards, it is a significant contribution to the water works engineering field. You can depend on it for permanence and maximum performance. Descriptive literature available on request.

AMERICAN PIPE & CONSTRUCTION COMPANY

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines.

P. O. Box 3428, Terminal Annex, Los Angeles 54, Calif.

Main office and plant—4635 Firestone Blvd., South Gate, Calif. *District offices and plants*—Oakland, San Diego, Portland, Ore.

Specializing in the manufacture and installation of American Concrete Cylinder Pipe, Lock-Joint Concrete Cylinder Pipe, Pre-stressed Lock-Joint Concrete Cylinder Pipe, Hume Centrifugal Concrete Pressure Pipe.

(*Continued from page 22*)

JOINT MEETING OF CUBAN AND FLORIDA SECTIONS

A holiday atmosphere pervaded the joint meeting of the Cuban and Florida Sections held in Havana, Cuba, November 22–24. For many of those registered, it was the first time that they had visited a Latin country, and they found their high school Spanish a welcome asset.

Held in the Cuban Society of Engineers building, the first session was presided over by Cuban Section Chairman Luis Machado. Dr. Manuel F. Supervielle, Mayor of Havana, delivered the address of welcome in the name of the city, and Manuel F. Puente, Cuban Section Director, also greeted the distinguished visitors from the North. A.W.W.A. President Wendell R. LaDue, who made the journey to Cuba to attend the meeting, responded to both addresses in the following terms:

> Senor Presidente Machado, Honorable Alcalde Supervielle, distinguidos visitantes, hermosas senoras y senoritas, caballeros y amigos —como vuestro presidente, tengo el honor de transmitir a vosotros el saludo y placemes de la sociedad paternal—la Asociación Americana de Acueductos. En la presente ocasión somos en realidad americanos porque esta junta de las Secciones Cubana y de la Florida simboliza la union de dos grandes pueblos en notable y significativa demostracion de buena voluntad, de comun interes y colaboracion.
>
> No ignoro la presencia de otros miembros y amigos de las grandes republicas de las islas de Carribeas y sud y centro-americanas.
>
> Nuestra causa es de reciproco interes. Nos coaligamos en un esfuerzo comun para lograr y conservar para los pueblos de nuestros respectivos paises mejores normas de vida, poniendo a su alcance medios de sanidad y un servicio de agua pura.
>
> Nuestra profesion es meritoria y elevada, de la cual nos sentimos justamente orgullosos. Nuestros grandes paises, mediante nuestros esfuerzos mutuos, marchan a la cabeza del mundo en lo que respecta a esta laudable obra.
>
> Gracias muchas, Honorable Alcalde, por vuestras generosas frases de bienvenida. Y muchas gracias, amigos.

The topics discussed at the first technical session were:

1. Peculiarities to be considered in the hydraulic problems of Tropical America, an extremely interesting discussion by Juan A. Cosculluela, past Chairman, Cuban Section. Among the many peculiarities pointed out was the fact that in the Latin countries the people are accustomed to consider water to be as free as the air they breathe, and that, therefore, it will take many years of education before private utilities and municipalities can assess water consumption by meters, the resistance to metering being tremendous.

2. "Development of Water Service in the Northern Republics of South America" was presented by George C. Bunker, who came all the way from Panama to attend the meeting. Bunker's paper showed the tremendous problems confronted and the heroic efforts that have been made in de-

(*Continued on page 44*)

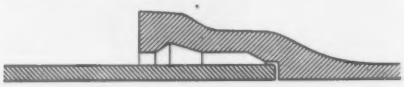
Clow-National

CAST IRON PIPE AND FITTINGS

CAN BE FURNISHED TO MEET THE REQUIREMENTS OF ALL EXISTING SPECIFICATIONS

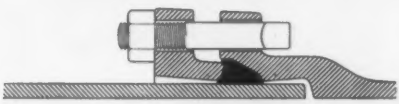
SUPER-deLAVAUD CENTRIFUGALLY CAST

The standard water bell is the most common type of cast iron pipe joint—popularly known as the "bell and spigot" joint. Available in sizes 3 to 24 inches inclusive, in 12 and 18-foot lengths, and for working pressures up to 250 pounds.



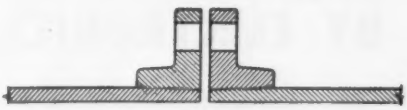
Standard Water Bell

A time-saving, easily installed mechanical joint cast iron pipe now used extensively. Made in all sizes from 3 inches through 24 inches, in 18-foot lengths, and for pressures up to 250 pounds.



"C-N" Mechanical Joint

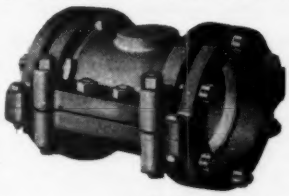
Cast iron flanged pipe is widely used for exposed pipe line work, inside and outside of buildings, for conducting water, steam, gas, oil and other fluids. Comes in same sizes and for same pressures as listed above, and in 12 and 18-foot lengths.



Flanged Joint

CLOW MECHANICAL JOINT SPLIT REPAIR SLEEVE

NO LEADING OR CALKING—ONLY A RATCHET WRENCH NEEDED



F-1200
Clow Mechanical Joint
Split Sleeve

It is better to have Clow Split Sleeves on hand and NOT need them than to NEED them and not have them.

See page 87 of catalog PIPE ECONOMY for complete detailed information

JAMES B. CLOW & SONS

201-299 N. Talman Avenue (P. O. Box 6600 A) **CHICAGO 80, ILLINOIS**

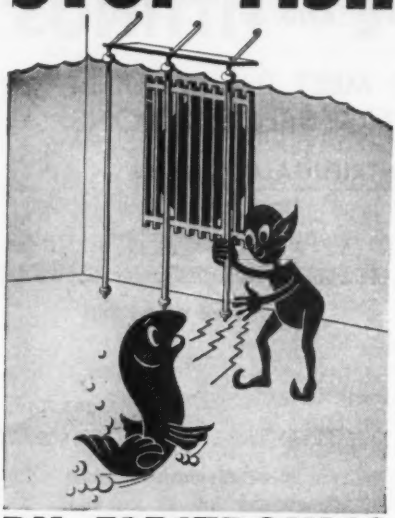
NATIONAL CAST IRON PIPE DIVISION

of James B. Clow & Sons

P. O. Box 2542, BIRMINGHAM 2, ALA.

Everything for the municipal water supply system

STOP FISH



BY ELECTRONICS

This patented fish control method employs modern electronics in overcoming a serious operating and maintenance problem. Fish of all sizes are kept at a *safe distance* from intake structures, or screens, by the use of an Electronic Control Unit. This equipment, generating special electrical impulses, energizes an electrode system designed and engineered for your particular fish control problem.

The Burkey Electric Fish Screen has been thoroughly proven through years of service in Condensing Water Intakes, Hydroelectric Plants, Water Systems and Industrial Pumping Installations.

DOES NOT STUN OR KILL FISH.

Recommended by State Conservation Officials.
Free literature and quotations upon request.

Electric Fish Screen Co.

1130 No. Poinsettia Place, Hollywood 46, Calif.

(*Continued from page 28*)

Farkas, Harry, San. Eng. Asst., Dept. of Water & Power, 734 N. St. Andrews Pl., Los Angeles 38, Calif. (Oct. '46)

Franklin, George C., Field Supervisor, North Carolina League of Municipalities, Raleigh Bldg., Raleigh, N.C. (Oct. '46)

Freeman, F. Clyde, Owner, Libby & Freeman, Box 2927, 711 W. Church St., Orlando, Fla. (Oct. '46)

Gainey, Richard J., San. Engr., Water Supply Equipment Branch, Engineer Board, Fort Belvoir, Va. (Oct. '46)

Guernsey, C. H., Prin. Owner, C. H. Guernsey & Co., 1414B N. Robinson St., Oklahoma City 2, Okla. (Oct. '46)

Haag, Donald M., Salesman, Grinnell Co., 520 Mateo, Los Angeles, Calif. (Oct. '46)

Hackbert, C. R., *see* Kimberly-Clark Corp.

Herringer, E. J., San. Engr., U.S. Public Health Service, 611 State Planters Bank Bldg., Richmond 19, Va. (Oct. '46)

Hooper, A. J., *see* Maintenance Engineering Corp.

Hoyt, Richard M., Salesman, Solvay Sales Corp., Box 4581, Jacksonville, Fla. (Oct. '46)

Jacoby, Gordon C., Treas., Jacoby, McGrayne & Co., 262 Main St., Paterson, N.J. (Oct. '46)

Johnson, Raymond E., Owner-Mgr., Schnick's Culligan Soft Water Service, Box 408, Alliance, Neb. (Oct. '46)

Keil, Russell D., Pres., Sonoma Water & Irrigation Co., 111 Sutter St., San Francisco 4, Calif. (Oct. '46)

Kimberly-Clark Corp., C. R. Hackbert, Research Library, Neenah, Wis. (Corp. M. Jan. '47)

Lovell, Theodore R., Engr., Thorpe Well Co., 1422 Wilson Ave., Des Moines, Iowa (Oct. '46)

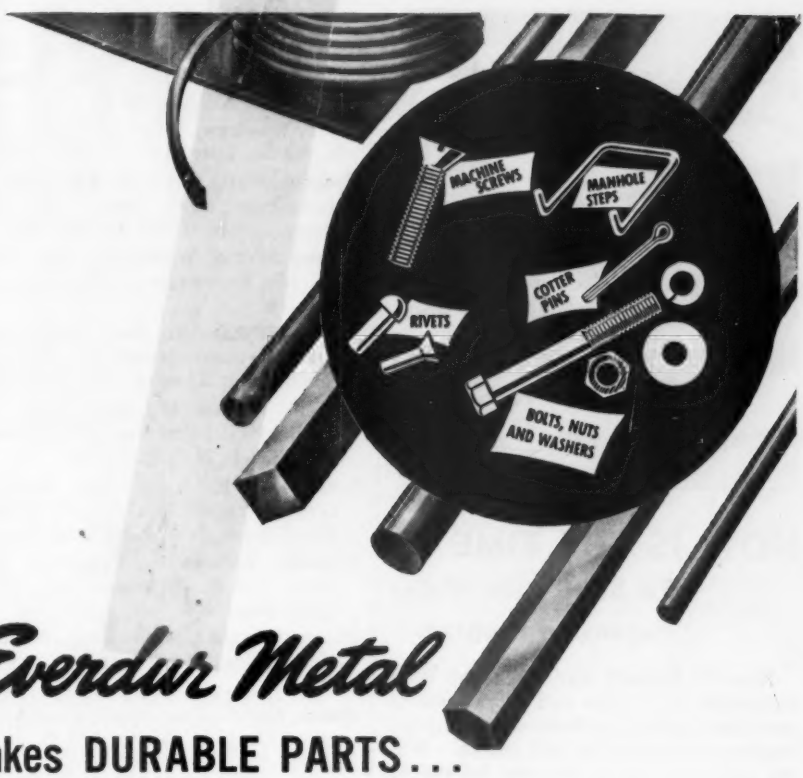
Maintenance Engineering Corp., A. J. Hooper, Box 2637, Houston 1, Tex. (Assoc. M. Oct. '46)

Mason, Ovid William, San Engr., Water & Sewage Disposal, Fort Sheridan, Ill. (Oct. '46)

May, Harold D., May Bros. Well Drilling Co., 4200 E. Broadway, Tampa, Fla. (Oct. '46)

McKean, Hugh C., City Engr., 301 S. "D" St., Fairfield, Iowa (Oct. '46)

(*Continued on page 32*)



Everdur Metal

makes DURABLE PARTS...

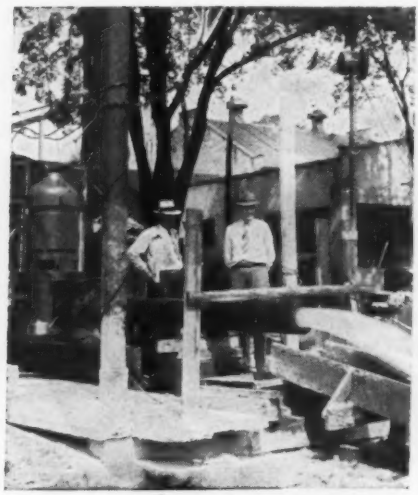
BECAUSE Everdur* combines high strength and corrosion resistance with ready workability and weldability, these copper-silicon alloys have proven outstandingly durable in hundreds of water works and sewage installations throughout the country.

Available in practically all commercial shapes, and in compositions suitable for hot or cold working and machining, Everdur lends itself to efficient, economical production of parts such as those illustrated, as well as to light-weight, welded, built-up construction of major equipment.

Water works and sewage equipment constructed of Everdur is still in service and in excellent condition after constant use since 1927. For detailed information on Everdur, write for Publications E-11 and E-5.

*Reg. U. S. Pat. Off. 46212.

ANACONDA
Everdur
COPPER-SILICON ALLOYS
THE AMERICAN BRASS COMPANY
General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS, LTD., *New Toronto, Ont.*



NOW IS THE TIME

To Start Your Water Expansion Program

Most of Layne's war work has been completed and more and more time is now being given to Well and Pump installations for cities and towns. Water expansion plans can now be pushed to completion.

Essential materials are becoming available in increased quantities. Crews are up to full strength. A full range of sizes in Layne Pumps is now being built.

If your city needs more water for population or industrial expansion, Layne engineers can extend valuable aid. Write for further details, catalogs, bulletins, etc.

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne

WELLS & PUMPS

(*Continued from page 30*)

McMillan, John D., Supt., City Water Dept., 540 Redlands Ave., Newport Beach, Calif. (Oct. '46)

Miller, Woodrow, City Councilman, 1167 N. 9th St., Colton, Calif. (Oct. '46)

Morenci Water & Elec. Co., The, F. Remington Barr, Supt., Box 508, Morenci, Ariz. (Corp. M. Oct. '46)

Muscoy Mutual Water Co., 2164 Darby St., San Bernardino, Calif. (Corp. M. Oct. '46)

Nelson, William R., Asst. Power House Supt., Reynolds Metals Co., Hurricane Creek Plant, Bauxite, Ark. (Oct. '46)

Newell, William H., San. Engr., U.S. Public Health Service, 1407 Hillsboro St., Raleigh, N.C. (Jan. '47)

Nicholls, F. R., Asst. Engr., Associated London Proprietary, Ltd., 311 Clapham Rd., London, S.W. 9, England (Jan. '46)

O'Reilly, Thomas C., Surveyor, Water Dept., 215 W. Broadway, Long Beach, Calif. (Oct. '46)

Patera, Edward L., Cons. Engr., 625 Royal Union Bldg., Des Moines 9, Iowa (Oct. '46)

Potter, Carl C., Dist. Public Health Engr., State Dept. of Health, 522 N. 3rd St., Burlington, Iowa (Oct. '46)

Redmond, John, Jr., Capt., Pharmacy Corps, Medical Sec., Headquarters 3rd Army, APO 403, c/o Postmaster, New York, N.Y. (Oct. '46)

Rives, James Allen, Prof. of San. Eng., Virginia Polytechnic Inst., University Club, Blacksburg, Va. (Oct. '46)

Rowe, W. P., Cons. Engr., Rowe & Webb, 2635 Main St., Riverside, Calif. (Oct. '46)

(*Continued on page 34*)

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(*Continued from page 32*)

Seidel, Harris Forrest, Graduate Student, 2124 Como Ave., St. Paul 8, Minn. (Jr. M. Jan. '46)

Short, Robert Earl, Graduate Student, North Carolina State College, Box 3134, Raleigh, N.C. (Jan. '47)

Smith, J. Guy, Jr., Chemist, Wilson Munic. Water Dept., R.F.D. No. 2, Wilson, N.C. (Oct. '46)

Stokes, W. F., Supt., City Water Com., Hendersonville, N.C. (Jan. '47)

Swartz, A. C., Secy.-Mgr., Newport Heights, Irrigation Dist., 116 E. 18th St., Costa Mesa, Calif. (Oct. '46)

Thomas, M. C., Supt., Water Works Plant, Cheraw, S.C. (Jan. '47)

Thomas, Ralph M., Civ. Engr., U.S. Engr. Dept., Box "E," Oak Ridge, Tenn. (Oct. '46)

Thomas, Robert O., Civ. Engr., Ruscardon Engrs., 108 W. 6th St., Los Angeles 14, Calif. (Oct. '46)

Tillman, D. L., City Clerk & Treas., Box 107, Cheraw, S.C. (Affil. Jan. '47)

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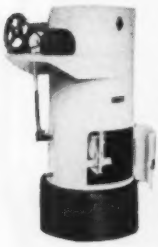

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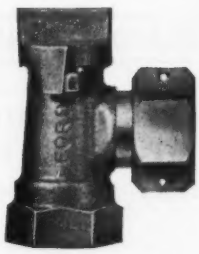

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Villaverde Nunez, Maximo, Chief Engr., Public Works, Rivera 75, Arroyo Apolo, Havana, Cuba (Oct. '46)

Whisler, Benjamin A., Head, Civ. Eng. Dept., Pennsylvania State College, State College, Pa. (Oct. '46)

Winlack, Donald, Dist. Mgr., California Water Service Co., 1417—17th St., Bakersfield, Calif. (Jan. '47)

Wrenn, G. W., *see* Black Mountain, Town of

Wyatt, James A., Water Supt., Arcata, Calif. (Oct. '46)

REINSTATEMENTS

Black, B. H., Sales Engr., 1923 E. 73rd St., Cleveland, Ohio (Oct. '38)

Bugbee, Alvin, Supt., Water Works, Trenton, N. J. (July '39)

Canariis, Svend A., Partner, Allied Pump & Supply Co., Box 5496, Jacksonville 7, Fla. (July '37)

Chamblee, J. V., Supt., Water Works, Selma, N.C. (Jan. '36)

(*Continued on page 36*)

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(*Continued from page 35*)

Jarvis, Alexander C. Cons. Engr., Veilesovej 51, Holte, Denmark (May '14)

McDonald, F. L., Chief San Engr., State Board of Health, 1725 N. Monroe St., Little Rock, Ark. (July '39)

Scobey, Fred C., Sr. Engr., U.S. Dept. of Agriculture, Box 755, Berkeley, Calif. (Jan. '32)

LOSSES

Deaths

Abrams, M. F., Wailes Dove-Hermiston Corp., 17 Battery Pl., New York 4, N.Y. (Oct. '37) *P*

Burnett, B. Julian, Pres., Burnett Chemical Co., Box 2328, Jacksonville, Fla. (July '44) *P*

Burnie, Arthur N., Consumers Water Co., Box 151, Pearl St. Station, Portland 6, Me. (Mar. '16)

Hodgkin, R. K., Engr., Layne–New York Co., Inc., 1200 W. Elizabeth Ave., Linden, N.J. (July '44) *P*

Milford, T. H., Chief Engr. & Director, Bureau of Sanitation, State Dept. of Public Health, Montgomery 4, Ala. (Apr. '38) *P*

Tobin, L. P., Supt. & Treas., Municipal Water & Light Dept., Camden, S.C. (Jan. '32)

Van Gilder, L., Engr. & Supt., Water Dept., City Hall, Atlantic City, N. J. (July '06) *Fuller Award '40. M*

Resignations

Adams, Howard J., Supt., Northern Illinois Water Corp., 120 N. Park St., Streator, Ill. (Jan. '38)

Albert, J. E., Vice-Pres., Associated Public Utilities Corp., 17 N. High St., Columbus, Ohio (Feb. '29)

Barnett, Gabriel, 1995 Strauss St., Brooklyn, N.Y. (Jan. '42)

Burnham, Lyle M., Supt., Water Works, Civic Center, Bartlesville, Okla. (Oct. '40)

Crane, D. Eugene, Box 6084 Stockyards Station, Denver, Colo. (Jan. '39)

Rice, Hugh B., Borough Mgr., State College, Pa. (June '34)

Statham, Richard N., Industrial Chemical Sales Div., 844 Leader Bldg., Cleveland, Ohio (Jan. '36)

(*Continued on page 38*)

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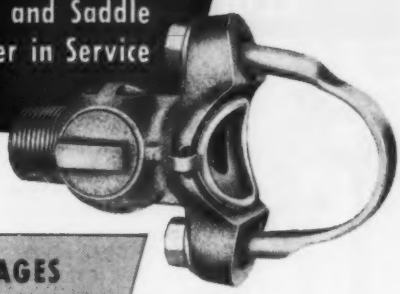

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(*Continued from page 36*)

Changes in Address

Changes received between November 5 and December 5, 1946

Alexander, C. E., 537 Oglethorpe Ave., Athens, Ga. (Jan. '42)

Bean, Elwood L., City Bureau of Water, 832 City Hall Annex, Philadelphia 7, Pa. (Apr. '28) *P*

Boardman, John, City Engr., Brawley, Calif. (Jan. '36)

Cissna, George W., Salesman, Neptune Meter Co., 254 Spring St., Atlanta 3, Ga. (July '35)

Coffin, Edwin F., Jr., 1st Lt., Asst. Engr. (R), U.S. Public Health Service, 15 Osborne St., Bloomfield, N.J. (Jan. '45) *P*

Colburn, B. S., Jr., Partner, Colburn & Weiss, 803 Jackson Bldg., Asheville, N.C. (July '46)

Crenshaw, J. C., American Water Works & Elec. Co., 50 Broad St., New York 4, N.Y. (July '41)

Dundas, N. F., 417 N. Main St., Los Angeles 12, Calif. (Oct. '46)

Eich, Henry F., 1333 Decatur St., Brooklyn 27, N.Y. (Apr. '43) *P*

Franklin, James W., Chief Clerk, Water Constr. Div., 3638—9th Ave., Los Angeles 16, Calif. (July '42)

Gettrust, J. S., Supt., Water Purif. & Pumping, Kent, Ohio (June '21) *MP*

Gulden, Horace B., Borough Mgr., Municipal Bldg., Lewistown, Pa. (Jan. '40)

Guthrie, B. L., Box 118, Brownwood, Tex. (Jan. '46)

Harris, Robert R., Asst. State San. Engr., State Dept. of Health, 630 S. 3rd St., Louisville, Ky. (Jan. '36)

Hay, Harold R., Bryn Mawr Gables, Bryn Mawr, Pa. (Apr. '44) *P*

Hurlbut, William W., 167 S. Mansfield Ave., Los Angeles 36, Calif. (May '24) *Director '33–'36, '37–'38. President '37. Diven Medal '41. Fuller Award '41. Honorary M. '43. AMP*

Jenkins, Joseph Edwin, Dist. San. Engr., State Health Dept., 301 N. Houston, Fort Worth, Tex. (Jr. M. July '42)

Krell, A. J., c/o Herman Goldman, 1006 N. Mariposa Ave., Los Angeles 27, Calif. (Apr. '39)

(*Continued on page 40*)

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Larson, Harry, Maj., Cascade Camp, Headquarters & Serv. Co., APO 512, New York, N.Y. (Oct. '41) *P*

Lewis, Albert W., Cleveland Sales Agent, U.S. Pipe & Foundry Co., 309 Park Bldg., 104 Public Square, Cleveland 14, Ohio (Jan. '39)

Lundquist, Harry, Repr., Neptune Meter Co., 5228 Brookview Ave., Minneapolis 10, Minn. (July '35) *M*

Luthin, John C., Supt., Water Dept., City Hall, Center St., Santa Cruz, Calif. (Jan. '40) *AMP*

McBride, George A., 1370 Harvard Rd., Grosse Point Park, Detroit 30, Mich. (July '41) *P*

McClintock, John H., 205 Illinois, Baytown, Tex. (Oct. '46)

Muddiman, John B. C., Indus. Eng. Div., Eng. Dept., E. I. du Pont De Nemours & Co., Wilmington, Del. (July '39)

Nunn, Henry E., c/o Ashley Classen, Engr., 215½ W. Tennessee St., Midland, Tex. (Oct. '34)

(Continued on page 42)

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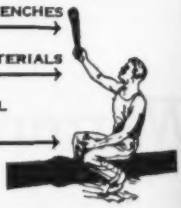

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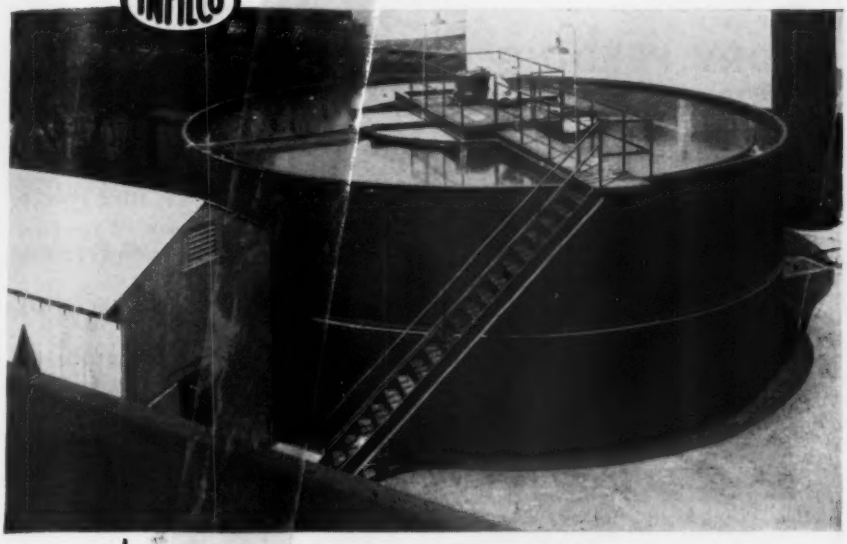

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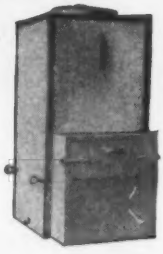

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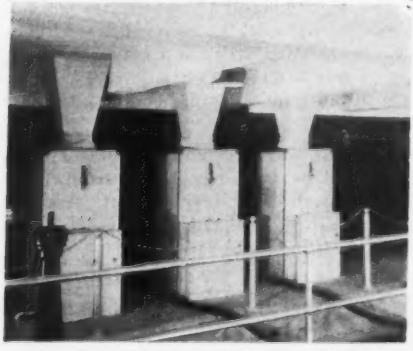

(Continued from page 40)

Oliver, Gilberto, Norte St. 21, Rio Piedras, Puerto Rico (Jr. M. Apr. '46)

Rhinehart, John R., 332 Fairfield Ave., Ridgewood, N.J. (Oct. '45)

Speir, William J., Repr., 127 N. 8th Pocatello, Idaho (Apr. '46)

Stolp, R. C., Stolp Eng. Co., 2415—3rd Ave., S., Minneapolis 4, Minn. (Jan. '46)

Tait, Robert S., Asst. Supt., Water Dept., City Hall, Center St., Santa Cruz, Calif. (Oct. '25) *M*

Trowbridge, A. L., 2724—19th St., Bakersfield, Calif. (Jan. '42) *M*

Trygg, Charles E., 3843 Forest Park, St. Louis 8, Mo. (Jr. M. Oct. '42) *P*

Weaver, Stuart M., Exec. Vice-Pres., Ideal Elec. & Mfg. Co., Mansfield, Ohio (Jan. '25)

Williams, William D., 550 W. Vermont Ave., Phoenix, Ariz. (Apr. '43)

Winslow, Edward L., Jr., Northeastern Div., U.S. Engrs., Park Square Bldg., Boston 16, Mass. (Apr. '30)

Wood, Frank B., 2120 Cherry St., Vicksburg, Miss. (Oct. '42)

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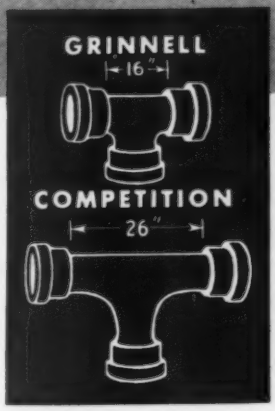

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Fig. 521
Sleeve (Solid)

Fig. 522
Split Sleeve

Fig. 511
Tee

Fig. 515
Blow-off Tee

Fig. 529
Long
Flanged
Socket

Fig. 505
Long ¼ Bend

Fig. 533
Warren Coupling

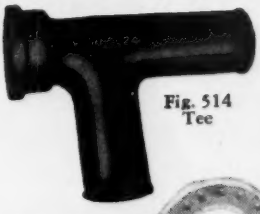


Fig. 514
Tee

Fig. 516
Cross

Fig. 507
⅛ Bend

GRINNELL

WHENEVER PIPING IS INVOLVED

(*Continued from page 24*)

veloping the water systems of the countries mentioned. The direct relation between the degree of civilization and the development of water supply systems was also mentioned in the address.

3. A report on "Actual Chlorination Practice" was presented by Dr. Harry A. Faber of the Chlorine Institute, New York. This paper was of tremendous interest to all as the information was of universal application, and Dr. Faber was warmly congratulated for the splendid way in which he handled the subject.

The technical session was followed by a buffet supper at the Engineers' Club, where the visitors were introduced to such Cuban dishes as "Congri Oriental" and tamales.

On Saturday morning the members visited the Univ. of Havana where they were given a "Café de Honor" by Dr. Gustavo Sterling, Dean of the College of Eng. After a trip through the Engineering School, the session was again convened at the Engineers' Club, and presided over by C. F. Wertz, Chairman of the Florida Section. The following papers were presented:

1. "Maximum Hourly Rates in Cuban Water Services," by José Garcia Montes, past-Director of the Cuban Section. This paper, of a highly technical nature, showed the process of development of the formulas for arriving at proper water consumption calculations, as well as charges. Due to the author's illness, the paper was read by Manuel Puente.

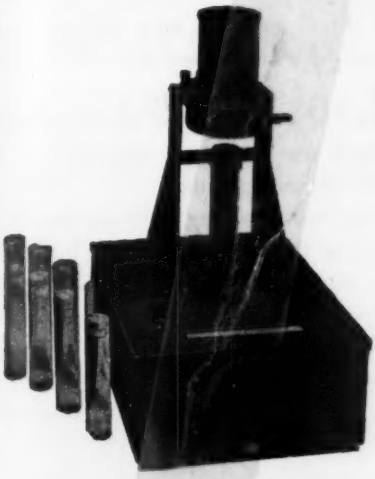
2. "Water Waste Surveys," by E. D. Case, Pres., Pitometer Co., which was read by Laurence Daniel, Secy. of the Cuban Section. This paper was extremely interesting to all, as it showed the development of the pitometer and the method by which water waste surveys are made, as well as the tremendous advantages to be derived from these surveys.

3. "Fundamental Principles in Water Main Cleaning in the Tropics and Semi-Tropics," by J. A. Frank, Vice-Pres., National Water Main Cleaning Co., New York. This paper was illustrated by slides which showed the hazards of dirty water mains as well as the decrease in efficiency of operation of water plants with dirty mains.

Following the technical papers, A.W.W.A. Secretary Harry E. Jordan made the announcement of the Fuller Awards for both the Florida and the Cuban Sections. This award went to Juan A. Cosculluela of the Cuban Section, and "Caesar" Wertz of the Florida Section. Both were congratulated and applauded, as they were well deserving of the high honor bestowed on them.

The meeting then adjourned to the Bacardi Bar, where Urbano del Real, Pres. of the Bacardí Co., regaled everyone with the products of his manufacture until it was time for lunch at the Tropical Gardens, under the auspices of Enrique J. Montoulieu, past-Chairman and now enthusiastic Trustee of the Cuban Section. The lunch was held on the spot where the

(*Continued on page 46*)



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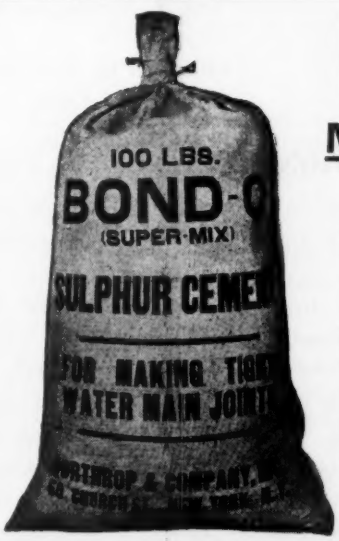

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(*Continued from page 44*)

first industry of Cuba was established three centuries ago, and everyone agreed that the food and drink produced by Montoulieu was of excellent quality and inexhaustible as to quantity.

Those who wished were then taken on a tour of the Havana Water Works by Abel Fernández, who conducted the party not only through the water works but also to the various new improvements.

On Sunday morning, following a business meeting held separately by each section, a "Criollo" lunch was served at the Habana Yacht Club. The President of Cuba was represented in the person of his Naval Attaché, and the American Embassy by the First Secretary. The Luncheon was jointly presided over by President LaDue and Mario Pedroso, President of the Habana Yacht Club, an enthusiastic member of the Cuban Section. The Mayor of Havana was present as well as a number of distinguished guests and the party was one that will be long remembered by all. A rhumba orchestra played for the gathering, and our friends from the North showed that music knows no boundaries and that water and music make for splendid international co-operation.

The report would not be complete without mentioning our visitors from Mexico, Venezuela and Panama, who attended the convention and added a very colorful tone to the gathering.

To sum up, the joint meeting was unanimously pronounced a huge success, and it is planned to celebrate the occasion yearly, alternating between Florida and Cuba.

LAURENCE H. DANIEL
Secretary-Treasurer

SOUTHEASTERN SECTION MEETING

The Southeastern Section held its annual meeting in Savannah, Ga., September 9–11, 1946. Approximately 200 members and guests registered for the technical sessions.

The convention was called to order by Section Chairman W. W. Pointer, after which J. A. Holmes, Vice-Pres., National Aluminate Corp., Chicago, presented the first paper, summarizing "Recent Developments in the Use of Phosphates for Control of Scale and Corrosion in Water Supplies." Henry Mathews, Thomasville, Ga., was scheduled to discuss the paper, but, in his absence, W. O. Widener of the National Aluminate Corp., who has been working with Mathews on corrosion control problems, commented on the results obtained at the Thomasville plant.

Robert Barnes of the Bristol Co. presented a report on "pH Measurement and Its Application to Water Treatment," which was discussed by A. T. Story of the Atlanta Water Works, who gave statistics obtained in Atlanta plant applications.

(*Continued on page 48*)

PERMUTIT SPAULDING PRECIPITATOR INCREASES CITY'S CAPACITY FOR TREATING WATER SUPPLY ... *AND IN LESS LAND SPACE!*

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PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 46*)

R. R. Adams of the J. E. Sirrine Co. then outlined the study made by his company of the industrial water supply for the city of Savannah and discussed the various features of the proposed treatment plant.

An informal discussion of "Balanced Municipal Fire Protection" was led by O. G. Carpenter of the Southeastern Underwriters' Assn., who pointed out the numerous factors which had to be taken into consideration before any rating for a municipality could be given. Considerable discussion from the floor followed and Carpenter was called upon to answer many questions on his subject.

F. W. Chapman, Supt. of Utilities, Greenwood, S.C., led off the second day's program with a paper on "Chlorine Dioxide Use in Water Supply at Greenwood." General discussion and a report on the development of the chlorine dioxide process by J. D. MacMahon of the Mathieson Alkali Works, Inc., followed.

Charles E. Hursh of the U.S. Dept. of Agriculture, Asheville, N.C., presented a paper on "Forest Control on Watersheds," pointing out that proper cutting on the watershed not only produced more water, but often was more advisable than leaving the original forest cover intact.

W. W. Brush, Editor, *Water Works Engineering,* discussed the problem of "Postwar Water Rates," indicating that the increased cost of construction, maintenance and labor made it imperative for water utilities to revise rates for service in order to balance budgets and to render satisfactory service. A.W.W.A. Secretary Harry E. Jordan then outlined a public relations program, in which he pointed out that every complaint received should have prompt and courteous attention and that a final report on the findings of the department should be made to the complainant.

A sound motion picture prepared by the Cast Iron Pipe Research Assn. introduced the final day's technical program. T. E. P. Woodward, Supt., Water Dept., Macon, Ga., then presented a paper on "Modern Distribution Shop Practices," which evoked considerable discussion from the floor. The session was closed with a paper by John M. Perryman of R. D. Cole Co., Newnan, Ga., on the use of "Aluminum for Water Works Structures" (Jour. A.W.W.A., **38**: 1327 (1946)).

A Fellowship Room sponsored by the manufacturers' association provided entertainment each night of the convention. Also, L. A. East, Supt. of the Savannah Water Dept., was host to approximately 300 at a shore dinner at the Country Club. The annual banquet was featured by the address A.W.W.A. President Wendell R. LaDue.

Francis Worthington Chapman, Supt., Greenwood, S.C., Water Works, was presented the George Warren Fuller Award for his outstanding work in the advancement of the Southeastern Section.

B. P. Rice
Secretary-Treasurer

(*Continued on page 52*)

Products for Treatment of Water, Sewage, and Industrial Wastes

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTH (Min.)	SHIPPING CONTAINERS	APPLICATIONS
Sodium Sulfate, Crystal $Na_2SO_4 \cdot 10H_2O$ (*Glauber's Salt*)	Crystal & Needle Cryst.	96% $Na_2SO_4 \cdot 10H_2O$	Barrels Bags Drums	Neutral Solution. Boiler water treatment (maintenance of sulfate-carbonate ratio).
Sodium Sulfate, Anhydrous Na_2SO_4	Powdered	99.5% Na_2SO_4	Bags Barrels	Neutral Solution. Boiler water treatment (maintenance of sulfate-carbonate ratio).
Trisodium Phosphate $Na_3PO_4 \cdot 12H_2O$ (*TSP*)	Crystal	98.5–103% $Na_3PO_4 \cdot 12H_2O$ (Equiv. 19% P_2O_5)	Bags Barrels Fibre Drums	Boiler water treatment. Cleaning compound. 1% Sol. pH 11.8-12.0.
Disodium Phosphate, Crystal $Na_2HPO_4 \cdot 12H_2O$	Crystal	98% $Na_2HPO_4 \cdot 12H_2O$ (Equiv. 19.5% P_2O_5)	Bags Barrels Fibre Drums	Boiler water. (Calcium and magnesium precipitation.) 1% Sol. pH 8.4.
Disodium Phosphate, Anhydrous Na_2HPO_4	Powdered Flake	96% Na_2HPO_4 (Equiv. 48% P_2O_5)	Bags Barrels Fibre Drums	Same as Crystal, but stronger product.
Sodium Fluoride NaF (*Fluoride*)	Powdered (white or blue colored: Nile Blue) Light or dense	90% and 95% NaF	Bags Barrels Fibre Drums	Fluorination of water supplies. (For information, consult with local and state health officials.)

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(*Continued from page 48*)

WEST VIRGINIA SECTION MEETING

The eighth annual meeting of the West Virginia Section, held at the Prichard Hotel, Huntington, W.Va., on October 24–25, 1946, brought together 132 members and guests of the section. All technical sessions were well attended and the special efforts to stimulate discussion from the floor were fairly successful.

Mayor Paul O. Fiedler of Huntington opened the meeting with an address of welcome, after which the technical program commenced with the presentation of a paper by D. V. Moses, Tech. Supt., and S. C. Grey, Chemist, both of E. I. du Pont de Nemours Co., Belle, who described the construction and operation of a photoelectric device for the continuous determination and recording of residual chlorine.

Following, was an address by A.W.W.A. past-President Leonard N. Thompson, who spoke on "Your Water Department Is What You Make It," stressing the importance of selling the organization not only to the public, but to its own personnel, and giving some practical suggestions on how to achieve that result.

Paul D. Simmons, Chemist, Weirton Steel Co., in a paper entitled "Chlorine Dioxide Treatment at Weirton," reported excellent results in combating phenolic tastes by use of the new chemical.

W. H. Lang, Asst. Editor, *Water Works Engineering*, next made a plea for more research in the water works field, pointing out that, considering the size and importance of the industry, there is now but a meager allocation of funds to scientific development.

Final item on the first day's program was an inspection trip to the Guyandotte Pumping Station of the Huntington Water Corp., where members were able to observe in operation the 10-mgd. high-pressure aerator used to reduce taste- and odor-producing compounds in the Ohio River raw water supply.

On the following day, C. P. Hoover, Chief Chemist, Filtration Plant, Columbus, Ohio, opened the meeting with a report on "The Bad Behavior of Water—On Certain Occasions," pointing out that many of the difficulties with quality in the distribution system are traceable to "mistreatment" in the plant.

The balance of the morning was devoted to question and answer discussions of the following subjects: "Painting and Repairing Steel Tanks," led by W. S. Staub; "Public Relations," led by H. Cable Cramer; and "Cross-Connections," led by H. K. Gidley.

Leading off the final session were two motion pictures: "Installing Cast-Iron Pipe," sponsored by the Cast Iron Pipe Research Assn.; and "Clean Waters," presented by the General Electric Co. These were followed by papers by A. Joseph Moors, Engr., U.S. Engr. Office, Hunting-

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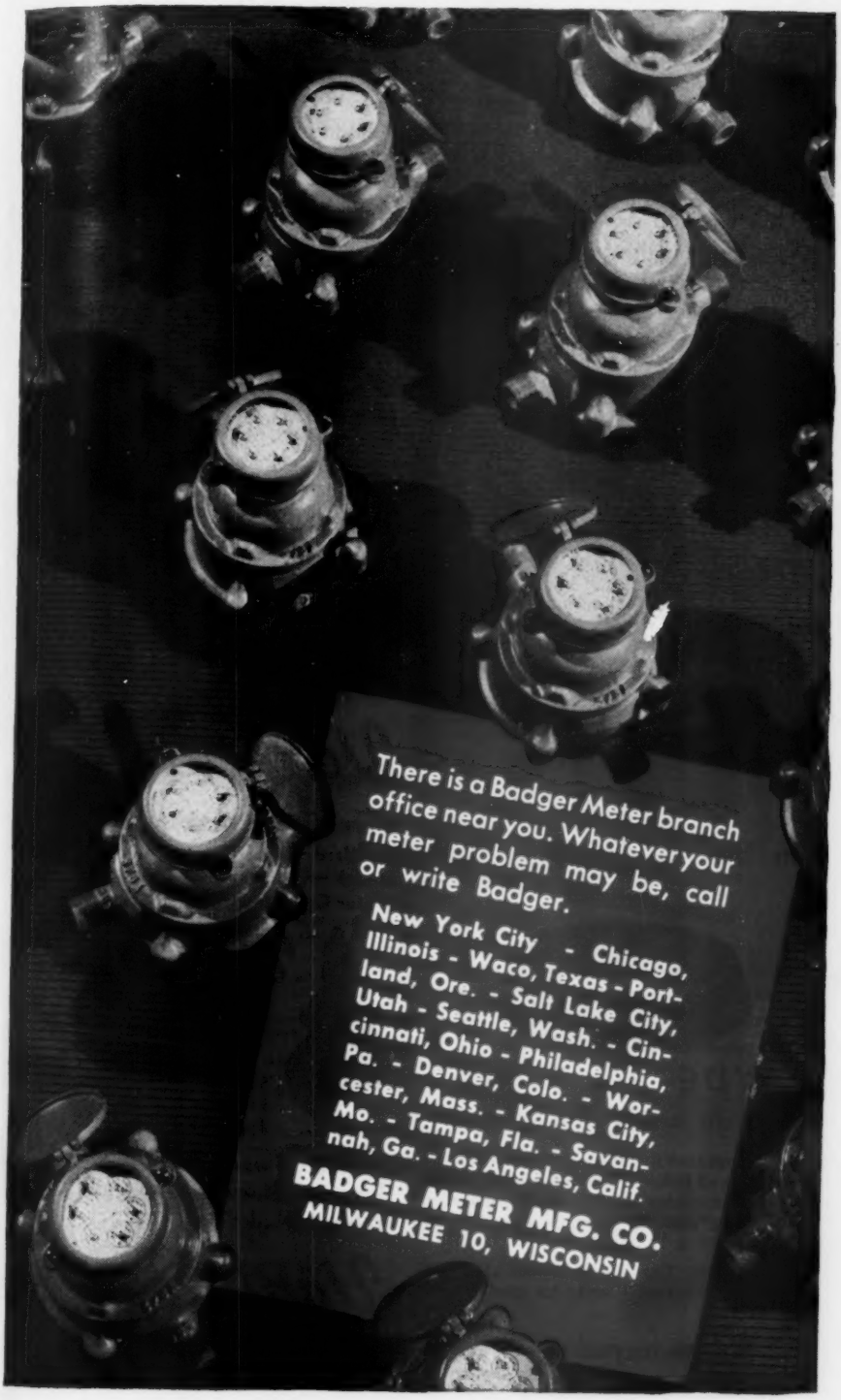
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(*Continued from page 52*)

ton, and K. S. Watson, Chem. Engr., State Water Com., Charleston, together with R. G. McCall, Assoc. Engr., State Health Dept., Charleston. Moors discussed the flood control program in southern West Virginia and Watson and McCall made a progress report on the abatement of pollution in West Virginia streams.

The session closed with an account of the "Improvement Program of the Fairmont Filtration Plant," presented by Edward Shroyer, Supt. of Filtration, Fairmont, and a description of the "Destruction of the Shinnston Water Supply by Coal Mining Operations," by W. B. Stewart, Supt. of the Shinnston Water Works.

At the annual banquet, presided over by Toastmaster C. W. Strickling, Huntington Attorney, announcement was made of the presentation of the George Warren Fuller Award to John Chubbuck Edwards, Asst. Mgr., Huntington Water Corp., "for outstanding service to his community through the efficient performance of his duties in water purification and his continued unassuming service to West Virginia water works organizations over the past 18 years." An hour's entertainment followed.

J. B. HARRINGTON
Secretary-Treasurer

(*Continued on page 56*)

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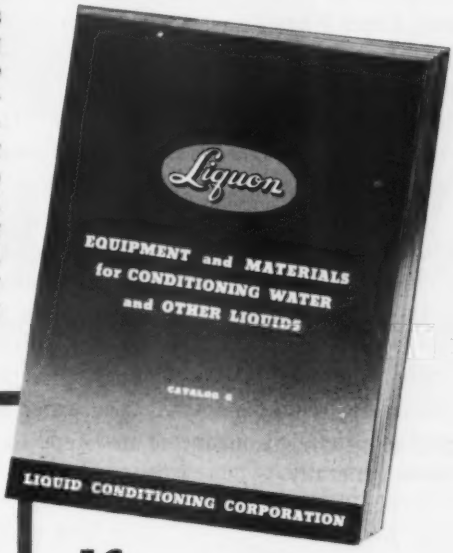

Some of the Subjects Covered

WHY are different methods of water treatment in use?

HOW do these different methods of water treatment compare in the results obtained?

WHERE should each of the different methods of water treatment be used?

WHAT are the most advanced methods and equipment for water treatment?

WHICH is the most effective water treatment for removing hardness . . . alkalinity . . . minerals . . . turbidity . . . gases . . . other impurities?

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(*Continued from page 54*)

SOUTHWEST SECTION MEETING

The Southwest Section held its 35th annual meeting in Galveston, Tex., October 14–17. Commissioner Chuoke and Water Plant Mgr. Henry Wilkens Jr. of Galveston served as hosts to the 430 delegates who registered for the three full days of technical sessions.

Following A.W.W.A. President Wendell R. LaDue's opening message on "Water Self-Analysis," a series of papers on water works management were presented.

First subject under discussion was employee training, opened by Ralph H. Settles of the Houston, Tex., Veterans Administration office with a description of "On-the-Job Training Under Public Law 679." S. C. Casteel, Chief Engr., East St. Louis & Interurban Water Co., East St. Louis, Ill., then discussed the application of employee training methods to water works, emphasizing the importance of proper selection, the use of aptitude tests and merit rating of employees. He reported as advantages of a systematic training program increased employee efficiency, improved morale, better employee and customer relations and an over-all financial saving.

On the subject of public relations, R. N. Dyer, Personnel Supervisor, Humble Oil & Refining Co., Houston, Tex., delivered a paper entitled "Basic Principles of Sound Personnel Practices and Administration," in which he pointed out the value of maintaining good employer-employee relations. Homer A. Hunter, City Mgr., Lubbock, Tex., speaking on the subject "Silent Service Is Not Enough," carried these ideas one step further in discussing relations between the water department and the community and giving a detailed outline of the steps to be taken in improving public relations generally.

H. F. Webb, Gen. Safety Director, American Water Works & Electric Co., Inc., Pittsburgh, Pa., next took up the subject of developing and maintaining a constructive safety program in the water works field. In his paper entitled "Let's Talk About Safety," he outlined a program that has had splendid results in reducing lost-time accidents throughout the 68 water plants operated by his organization (Jour. A.W.W.A., **38**: 1387 (1946)).

Acting on the assumption that pipe supplies would increase rather than diminish, the Dept. had accepted a backlog of orders from 100 subdivisions requiring 245,126 ft. of pipe before October 8, when the Board of Water & Power Comrs. acted to call the present moratorium on extensions. Now, with only 78,500 ft. of pipe in stock, the Dept. will have to make only those installations which will yield the maximum of service.

A detailed description of the steps taken by the Dallas, Tex., Water Works to prevent a serious shortage as a result of unprecedented demands during the past year was given by K. F. Hoefle, Supt. Particularly interesting were his comments on the lawn sprinkling problem. When the city,

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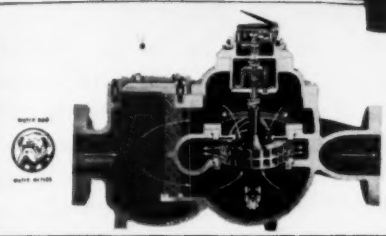

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(*Continued from page 56*)

which offers special rates for sprinkling water, broadcast an announcement of the shortage and asked consumers not to use water for lawn sprinkling, the result appeared to be negative, for the peak load thereupon increased.

Thomas F. Wolfe, Engr., Cast Iron Pipe Research Assn., Chicago, presented statistics on the benefits of cement lining cast-iron pipe in sustaining high carrying capacity coefficients, and Asa E. Hunt of Dallas, Tex., discussed "The Selection of Pumps and Their Capacities."

The place of water supply in fire protection was discussed by Hugh V. Keepers, Engr., Fire Prevention & Eng. Bureau of Texas, who outlined the differences between Texas grading schedules and those of the National Board of Fire Underwriters.

The Water Purification Session included the following papers: "An Ortho-tolidine Titration Procedure for Measuring Free Available Chlorine," by C. H. Connell, Assoc. Prof. of Sanitation, Texas A & M College; "Electronic Coagulation," prepared by Fred E. Stuart, Pres., Stuart-Brumley Corp., Baltimore, Md., and presented by O. M. Smith, Chemistry Dept., Oklahoma A & M College; "Chlorination," by A. E. Griffin, Asst. Director, Tech. Service Div., Wallace & Tiernan Co., Inc., Newark, N.J.; and "Corrosion Control with Calgon," prepared by Owen Rice and presented by J. P. Kleber, both of Calgon, Inc., Pittsburgh, Pa. The session concluded with a motion picture, entitled "Clear Water," sponsored by the Houston Lighting & Power Co. of Galveston, Tex.

Field demonstrations of a new water main and sewer cleaning machine by N. M. Redmond, Supt. of Constr., Sewer & Water Board, New Orleans, La., and of a valve inserting machine by a representative of the A. P. Smith Mfg. Co. of East Orange, N.J., concluded the second-day program.

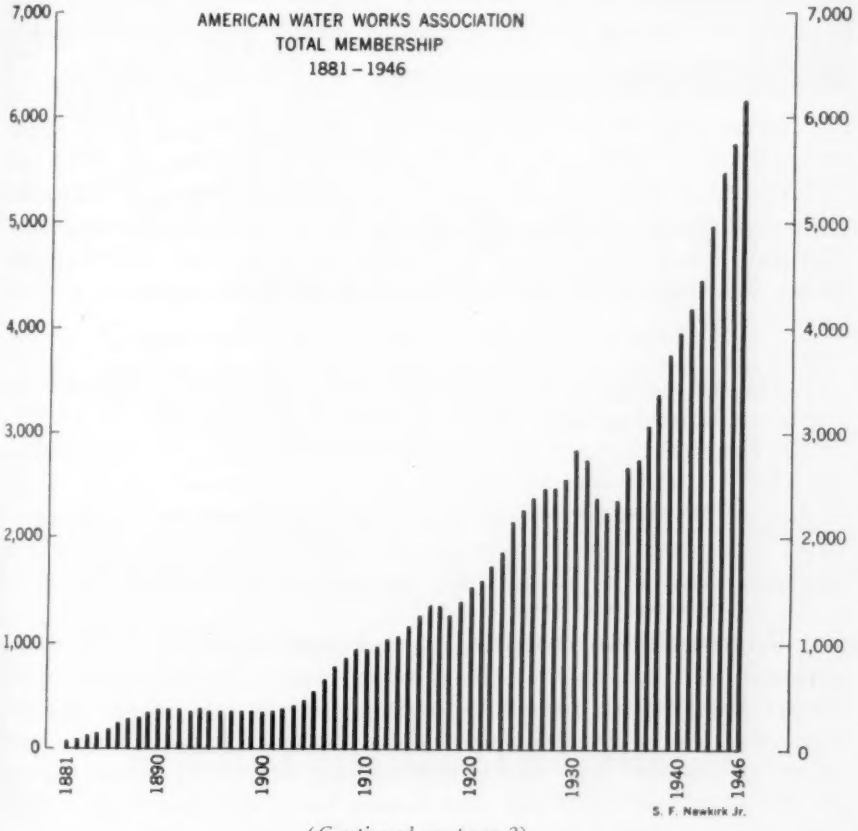
The final technical session was devoted entirely to well and ground water problems. Joe W. Lang, Houston, Tex., P. H. Jones, Baton Rouge, La., R. C. Baker, Fayetteville, Ark., and Stuart L. Schoff, Norman, Okla., all U.S. Geological Survey engineers, jointly discussed "Geology and Principal Ground Water Supplies in the Southwest Water Works Area." The discussion was developed by the following papers: "Method of Estimating Available Supplies of Ground Water," by B. A. Barnes, Board of Water Engrs., Austin, Tex.; "Experiences in Drilling and Maintaining Water Wells," by E. A. Vaubel and Sam L. Olsen, Layne-Texas Co., Houston; "Sanitary Construction and Protection of Wells," by V. M. Ehlers, State Board of Health, Austin, Tex.; and "An Engineer's View of Well Drilling Contracts," by Rex Collins, McAlester, Okla.

At the Convention Banquet, the George Warren Fuller Award was presented to Winfield Scott Mahlie, Supt. of Purif., Fort Worth, Tex., for "his long, faithful and valuable service in the purification field."

LESLIE A. JACKSON,
Secretary-Treasurer

NEWS OF THE FIELD

The growth of the American Water Works Association, graphically represented below, is a source of pride and satisfaction to every public servant in an industry that means much to the life of every city. Founded in 1881, the Association grew slowly until 1905, when its advance became more rapid. It passed the 1,000 mark in membership in 1912, passed 2,000 in 1924 and 3,000 in 1937. Its rapid growth in the late 20's was offset by the losses due to the depression. Although the A.W.W.A. lost members during the first World War, World War II brought an accelerated growth. The Association ended 1946 with 6,141 members and looks forward to passing 7,000 before its 75th anniversary. What the industry's best minds face today is the task of making the A.W.W.A. serve its field better than ever before. This means that new methods of service must be explored and made to work for the benefit of its members, the industry and the public.



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Postgraduate public health training fellowships for the school year beginning next fall are now available to engineers and physicians through a grant of $228,400 from the National Foundation for Infantile Paralysis "March of Dimes" fund.

The fellowships, which provide for an academic year of graduate training at an accredited school of public health or sanitary engineering, followed by three months of field training, are open to men and women citizens of the U.S. under 45 years of age. Engineers with Bachelor's or higher degrees in sanitary, civil or chemical engineering are eligible, as are those with degrees in other engineering fields who have had experience in public health or sanitary engineering. Physician applicants must have completed at least a year's interneship. Since the fellowships are intended to aid in the recruitment of trained health officers, they are not open to employees of state and local health departments for whom federal grant-in-aid funds are already available to the states.

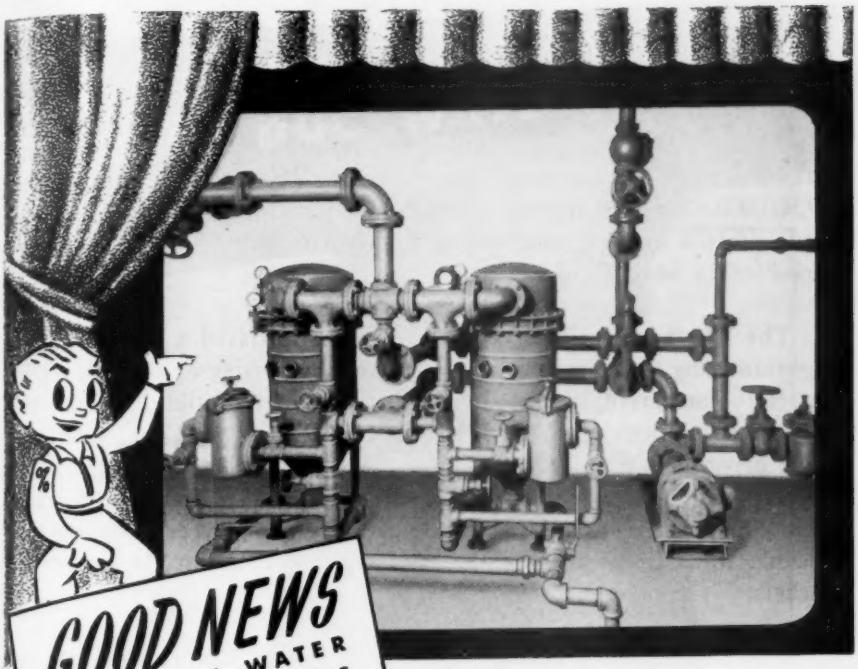
Further details may be obtained by writing to the Surgeon General, U.S. Public Health Service, 19th St. & Constitution Ave., NW, Washington, 25, D.C., *Attention* Public Health Training. Application deadline is May 1, 1947.

Jersey City, N.J., water rates were increased 33⅓ per cent, from 90¢ to $1.20 per 1,000 cu.ft., on February 1. The increase was authorized last December when the city commission passed a resolution calling for price revision for water supplied to Jersey City homes and industrial plants. Hoboken, North Arlington and Lyndhurst, which also use water from the Jersey City supply, will pay the increased rates upon expiration of their present contracts.

The water supply of Vancouver, B.C., has been condemned for use on public carriers both in the U.S. and in Canada by action of the U.S. Public Health Service and the Canadian Government, in both cases because the supply is unchlorinated. During the war, Vancouver's supply, which is drawn from mountain sources, was treated by chlorination under emergency orders from Ottawa, to protect the health of servicemen stationed in the area. Treatment, however, was discontinued a few months ago.

Up near the Arctic Circle, the people of Reykjavik, Iceland, are provided with hot, almost boiling, water from a ground water supply tapped through shafts some 1,200 ft. deep. Far to the south, in Boulder, Colo., the public is supplied with ice water obtained from a basin on nearby Arapahoe Glacier. And then in Chattanooga, Tenn., this winter, the city is drawing heat from cold well water to keep five of its homes warm. Make your reservations now for ice skating at Hot Springs next July.

(*Continued on page 4*)



PUR-O-CEL

DIATOMACEOUS EARTH FILTER

%PROPORTIONEERS, INC.% announces the new Pur-O-Cel pressure filter for small water treatment plants. Perfected during the war, this new filter utilizes thin mats of interlaced particles of diatomaceous earth instead of a sand bed . . . with many outstanding advantages over conventional sand filters:

1. **Complete turbidity removal.** **Produces clear, brilliant water.**
2. **High bacteria removal.** **Filters out amoebic dysentery cysts.**
3. **High filtration rates.** **Safe filtration at any flow rate.**
4. **Reduced space requirements.** **Saves construction and housing costs.**
5. **Simpler operation.** **Filtering becomes a mechanical operation, not a chemical process.**

Write today for Bulletin 1550

% PROPORTIONEERS, INC. %

61 CODDING ST., PROVIDENCE 1, R. I.

(*Continued from page 2*)

The largest dam below the equator, 380 ft. high and impounding 460 mil.gal., is to be constructed in the Warragamba Gorge to provide for the rapidly mounting water supply demands of the city of Sydney, Australia. The 250-ft. wide dam, which will measure 350 ft. at its base and 30 ft. at its crest, will take seven years to build and is expected to cost about $19,500,000. Located approximately 70 miles from Sydney, the dam promises to provide a supply that will be sufficient to meet the city's peak demands for the next 30 or 40 years.

The Waukesha, Wis., Water Dept. has initiated a new program of guaranteeing the efficiency of its employees by passing on to them a portion of the net profit resulting from operation of the utility. Under the plan, which has been approved by the State Public Service Com., 4 per cent of the department's annual net earnings will be distributed among its employees in the form of a bonus. The amount, which is limited to a maximum of $200 per year, will be apportioned among employees according to a schedule which gives the highest percentage to those in the lower pay brackets.

The Los Angeles Board of Water & Power Comrs. recently received authorization to purchase, by negotiation or condemnation, the private water systems which serve approximately 110,000 persons within the city. Largest of the ten private companies involved are the Southern California Water Co., Conservative Water Co., and the Investment Water Corp., which together provide water to about 94 per cent of the 27,000 services included in the collective systems. The remaining concerns, which serve about 7,000 people, are Athens Water Co., Palisades del Rey Water Co., El Jardin Mutual, Airways Water Co., Dominguez, Moneta and Pembrook. Fixed capital of these private firms is estimated at $4,300,000, with approximately $600,000 annual revenue.

(*Continued on page 6*)

Cut Your Packing Costs!

by using

MABBS RAWHIDE PACKING

on your Pumps and Valve Stems

Frictionless — it saves power; lasts for years

Free Sample and Literature Upon Request

MABBS HYDRAULIC PACKING CO.

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Worthington-Gamon

WATCH DOG WATER METERS

SURE TO MEET YOUR SPECIFICATIONS FOR ACCURACY, LOW MAINTENANCE, LONG LIFE

Before you invest in water meters, get acquainted with the design and performance advantages which make Worthington-Gamon Watch Dog Water Meters first choice of so many municipalities and private water companies in the United States.

WATCH DOG WATER METERS

"Watch Dog" models . . . made in standard capacities from 20 gpm up; frost-proof and split case in household sizes. Disc type, Turbine type or Compound type. Write for Bulletin.

06-2A

WORTHINGTON-GAMON METER COMPANY

296 South Street, Newark 5, New Jersey

Subsidiary of

WORTHINGTON

PUMP AND MACHINERY CORPORATION

(*Continued from page 4*)

Guayaquil, Ecuador, has contracted with three U.S. firms for investigations, design, construction and initial supervision of operation for a new water works system to serve the city. Buck, Seifert & Jost, Cons. Engrs., New York, are making a study of the water supply requirements and proposed sources of supply and, after completion of their report, will prepare construction plans and specifications and supervise the construction. The Frederick Snare Corp. of New York will perform the construction work, upon completion of which the Pitometer Co., New York, will supervise operation of the system for one year.

The new system is expected to comprise intake works on the Daule River, about 30 km. north, and an aqueduct leading to the city, together with large sedimentation basins to clarify partially the silt-laden river water, diesel-electric pumping station, filtration plant, distribution reservoirs and transmission and distribution system improvements. The cost of about $4,000,000 will be financed by the Export-Import Bank.

Guayaquil, a city of about 170,000, is at present supplied with water from mountain streams in the foothills of the Andes, some 90 km. to the east. This supply, with a present yield of about 5.8 mgd., was almost en-

(*Continued on page 8*)

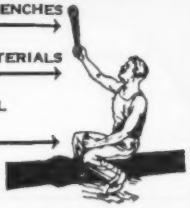
3 *Money, Time and Labor Saving Features of*

UNIVERSAL CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.



For water supply, fire protection systems, sewage disposal systems, industrial, and irrigation. Flexible.

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386 FOURTH AVENUE, NEW YORK 16, N. Y.

Gentlemen: Send us information and catalog on UNIVERSAL CAST IRON PIPE.

NAME _____

STREET _____

CITY _____

Vogt

Fire Hydrants

Standard—"Traffic Model"—Flush Type—Water Crane Type

Vogt

Gate Valves

Non-Rising Stem—Outside Screw and Yoke—Hub End—Flanged End—Ends to Fit Any Type Pipe

Also—Floor Stands, Shear Gates—Tapping Sleeves and Valves—Flap Valves—Mud Valves

Vogt

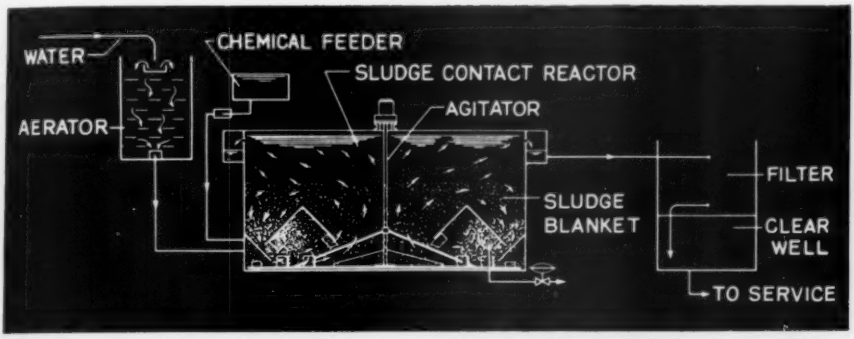
Brothers Mfg. Co., Inc.
Main at 14th Street, Louisville 3, Ky.

IRON AND MANGANESE REMOVAL

an "iffy" job

that requires experienced specialists

- if iron is present without manganese
- if manganese is present as well as iron
- if impurities are in ferrous and manganous form
- if iron is present in organic combination
- if hardness also is to be removed
- if water is high in alkalinity
- if water is high in CO_2
- if air enters the system
- if pH value is low



How to remove troublesome iron and manganese from your water supply? The choice depends upon many factors, and lies between:

Injecting air just ahead of pressure filters . . .

Open aerator and filters . . .

Contact filters plus final filters . . .

Sludge Contact Reactor, plus chemicals . . .

Sodium Zeolite . . .

Manganese Zeolite . . .

The LIQUON engineers can apply more than 30 years of specialized experience to your particular problem of iron and manganese removal. In addition, they can also supply exactly the right equipment and materials, because LIQUON service includes every process and every type of equipment for any water conditioning requirement.

Therefore, if your water supply contains iron or manganese . . . or any other impurity . . . consult the LIQUON engineers without delay . . . no obligation, of course.

Liquon

LIQUID CONDITIONING CORPORATION

114 East Price Street, Linden, N. J.

Engineering Service Representatives in Principal Cities

(*Continued from page 6*)

tirely rebuilt a little more than 20 years ago, but proved inadequate to meet the rapid growth in requirements within a few years after completion. The hours of water service during the day have been restricted for many years and were still further curtailed early in 1946 by a break in a supply main under the Guaynos River, since repaired.

The perils of well digging in pioneer days make exciting reading as told by Everett Dick in *The Sod-House Frontier* (D. Appleton-Century Co., Inc., New York, 1937). A reprint of the section on water problems in *The Driller* for November 1946 includes some hair-raising stories of the hazards of hand-digging, together with considerable historical information on the development of well-digging practices from the earliest pick-and-shovel methods.

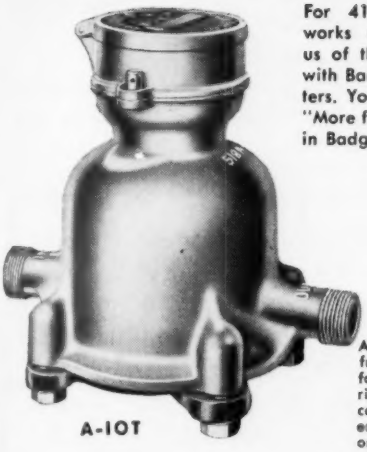
James R. Cook, formerly Project Engr. in charge of the design of water and sewer systems for Caracas, Venezuela, now is Resident Mgr. for Buck, Seifert & Jost, Cons. San. Engrs., with headquarters at San Juan, P.R., where he will be engaged on important sewage and water works improvement projects for the Insular Government.

Cook has been associated with work in Latin America for about five years, first with the Caribbean Architect-Engr. on design of water supply and sewerage works for Army Bases in Trinidad, Antigua, British Guiana and St. Lucia and later with Parsons, Brinckerhoff, Hogan & Macdonald, Engrs., on design of dams, hydroelectric plants and water and sewerage improvements in Venezuela.

Prior to his work in South America, Cook worked on the rehabilitation of the Philadelphia water works system and had served with Allen Hazen, Cons. Engr., and successor organizations for nearly 18 years on important water supply projects, including those for Springfield, Mass., Providence, R.I., West Palm Beach and Miami, Fla., and Bogota, Colombia.

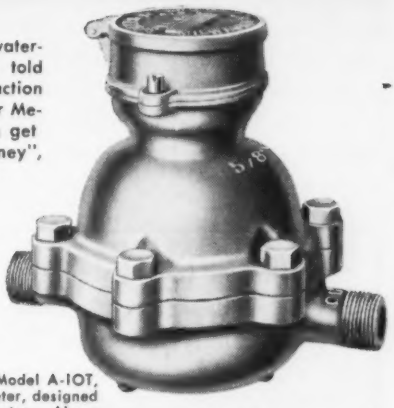
(*Continued on page 10*)

Let Badger Meters **SAVE** *for you!*



A-IOT

For 41 years waterworks men have told us of their satisfaction with Badger Water Meters. You, too, can get "More for your money", in Badger Meters.

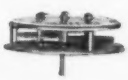


SC-IOT

Above, left, Model A-IOT, frost proof meter, designed for cold climates. Above right, Model SC-IOT, (split case), designed for warmer climates. Oil enclosed or open type gear trains are optional.

Two Piece Measuring Chamber—Snap joint construction; no screws; all bronze. Smooth internal surface eliminates excessive wear and maintains accuracy. An actual comparison will convince you.

Three Piece Disc — The disc is of the flat three piece design. Component parts are made of the best grade of vulcanized rubber. Extreme care is taken to see that all parts are concentric with each other.



Circular Reading Registers—All parts of non-ferrous materials, heavily plated to guard against corrosion. All bearings are rubber bushed. Dials have heavy copper base; black letters on white porcelain for ease in reading.

Straight Reading Registers — Non-ferrous materials; heavily plated. Indestructible brass number wheels are not affected by heat. Dials are of the same high quality as used on all regular Badger circular reading registers.

Men and women of Badger Meter take personal pride in Precision Production.

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(*Continued from page 8*)

Stuart M. Weaver has been Exec. Vice-Pres. of the Ideal Electric & Mfg. Co., Mansfield, Ohio, since his release from active Army service early last year. During his almost four years in service, Weaver was Chief of the Repairs & Utilities Div. of the Office of the Chief of Engrs. and acted as War Dept. Power Procurement Officer responsible for the renegotiation of all utility contracts serving installations of the War, Navy and Treasury Depts., the Maritime Com., the RFC and WSA.

Immediately prior to his Army service, Weaver was Supt. of the Montclair, N.J., Water Bureau and Exec. Asst. to the Director of Public Works, serving also as Acting Town Engr.

Clinton Inglee was a man who combined engineering competence with the art of gracious living. He was a pillar of his community, Amityville, New York, where he grew up, married, lived his active years and then passed the months of illness until his death just before Christmas 1946. He was for twenty years a member of the Village School Board. He was the president of his church when he died. But most of all, he was the friend of all his neighbors, a man who will be grievously missed by all those who knew of the kindly things he did.

The water works field has known him well for only a little more than a decade, although he contributed his skill to it for almost forty years. The Association first became generally aware of him when, in 1934, he was a part of the New York cast of one of those great home talent shows. His beautiful singing voice thrilled those who heard him then and in succeeding years, up to the war, when those features of Association Conventions were put aside. For years he was a member of the New York Singers Club. Among those who mourned at his funeral was his singing teacher, William Houston—an old man now—one who has long been his devoted friend as well as teacher.

It was his mechanical engineering ability that, from the time of his graduation from Stevens Institute in 1908, served to bring recognition to the National Water Main Cleaning Co. He had been president of the Manufacturers Association and a Director of the A.W.W.A., and at the time of his death was a member of its General Policy Committee.

The things he did in his business and in his Association life will always rest to his credit. But to those who knew the real Clinton Inglee, there will always be the memory of the gracious gentleman who found his greatest joy in doing kindly things for others.

(*Continued on page 12*)

still in there PUMPING!

American pumps installed many years ago are still delivering specified quantities of water at low cost on farms, in municipalities and industrial plants throughout the world. Today, with modern improvements, materials, and methods of manufacture, American pumps assure even more efficient, trouble-free service.

These pumps are designed to perform properly within a definite range. We suggest, therefore, that you submit your pumping problem to our engineering staff. Their recommendation will be based upon wide installation experience and sound engineering practice.

WATER LUBRICATION

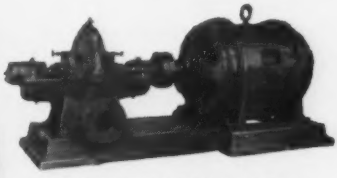
No on-the-job column changes necessary

DEEP WELL TURBINES

Features: Deep bronze packing box, designed for high pressure with minimum leakage. Top line shaft bearing, located *at the top* of the column, eliminates whipping through packing box.

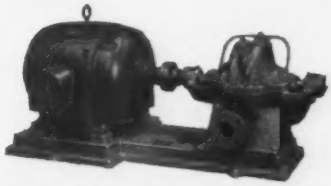
Bronze enclosed impellers have uniform, hand finished water passages. Given final machining after assembly on shaft to insure correct running clearance and rotative balance.

Send for Bulletin 245



DOUBLE SUCTION PUMPS

For a wide range of applications in general water supply. Split case, ball bearing design. Enclosed type bronze impeller with all water passages hand finished and exterior surfaces machined. *Bulletin No. 248.*



TWO STAGE CENTRIFUGAL PUMPS

For water booster service. Split case design. Passage from first to second stage entirely within casing, reducing friction losses to minimum. Back-to-back, single suction, bronze enclosed impellers. *Bulletin 246.*

AMERICAN WELL WORKS

IN OUR 78TH YEAR
112 North Broadway
AURORA, ILLINOIS

Pumping, Sewage Treatment, and Water Purification Equipment
RESEARCH · ENGINEERING · MANUFACTURING

Offices: Chicago • New York • Cleveland • Cincinnati • Kansas City • Sales Representatives throughout the World

(*Continued from page 10*)

Charles B. Burdick, well-known Chicago Cons. Engr., was awarded honorary membership in the American Society of Civil Engineers at its 94th annual meeting in the Hotel Commodore, New York, in mid-January. Burdick who has done water supply, flood relief and sewerage problem work for hundreds of cities in 38 states and several foreign countries has been a member of the A.W.W.A. since 1907 and an Honorary Member since 1944.

Malcolm Pirnie, New York consulting engineer, Chairman of the A.W.W.A. Water Works Practice Com. and former Association President, was one of the eight engineers who supervised the development of the "War Detection Plan," which is now being used by the Big Five powers to prevent future German and Japanese aggression. The plan, which represents the work of more than 50 of the country's leading engineers under the Joint Engineering Council, is based on the automatic detection of arms manufacturing through a close and continuing analysis of a nation's use of raw materials. In its lead article, *Look* magazine for December 24 gives a pictorial description of the program under the title "Peace on Earth—Dream or Possibility?"

(*Continued on page 14*)

Prevent Rusting

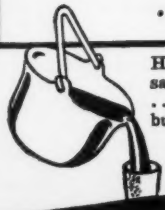
Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.

If your tanks and steel structures are not now protected by this proven low cost method, they should be. No obligation. Send for fully descriptive literature today.

RUSTA RESTOR
Division of
THE JOHNSTON & JENNINGS CO.
862 Addison Road, Cleveland 14, Ohio

How to join *more* bell and spigot cast iron water mains *per hour* ...*at less cost*



Haymanite creates substantial savings in time and materials . . . not only during installation, but while in actual service.

Haymanite
JOINTING COMPOUND

Each lb. does the work of 4 lbs. of lead . . . No caulking . . . No large bell holes . . . Easily applied . . . Permanent . . . Withstands vibration . . . Self-sealing when broken.

Immediate deliveries. Free catalog.

Producer also of M. H. Brand Caulking Lead

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ESTABLISHED 1869
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HERSEY WATER METERS

are accurate and dependable recording instruments—built with watch-like precision of only the best grade materials. More than half a century of engineering experience has developed a Hersey Water Meter of simple design with low maintenance cost.

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BRANCH OFFICES: NEW YORK — PORTLAND, ORE. PHILADELPHIA — ATLANTA — DALLAS — CHICAGO SAN FRANCISCO — LOS ANGELES

(*Continued from page 12*)

Neptune Meter Co., New York, recently announced the appointment of Dante E. Broggi, Vice-Pres. & Director, to the position of Gen. Mgr. of production, sales and research. Broggi's service with the company dates from 1920, when he was employed as a chemist and metallurgist.

Leonard Dworsky recently received an appointment as Sr. Asst. San. Engr. in the regular corps of the U.S. Public Health Service and an assignment to its General Sanitation Sec. in Washington, D.C. Following his release from the Army last February, Dworsky became associated with the Cook County, Ill., Dept. of Public Health as Sr. San. Engr., which position he left to accept his present appointment.

A Lt. Col. in the Army San. Corps, Dworsky was on active duty for five years. In his last overseas assignment, he was Malaria Control Officer for the Antilles Dept., covering the area from Florida to Brazil. When he returned to the U.S., he was assigned to a military government school and subsequently became Executive Officer to the Director of Training at the Military Govt. Staging Area, Monterey, Calif. Immediately before entering the Army, Dworsky had spent five years with the Illinois Dept. of Public Health.

(*Continued on page 16*)

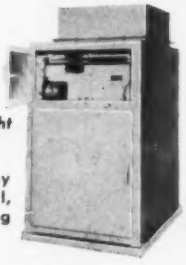
WHAT'S *YOUR* FEEDING PROBLEM?

OMEGA

CHEMICAL FEEDERS

A whale of a lot of chemical feeding problems have been solved with OMEGA "Loss-in-Weight" Gravimetric Feeders — the most accurate type of dry chemical feeders made. Feeding rate is instantly adjustable by dial over a 100 to 1 range, accurate to within 1% of rate set. Operation is fully automatic, with alarms to warn of over or under feeding. Automatic proportional control devices and OMEGA Dust Removers are easily installed.

Write for Bulletin.



OMEGA *Loss-in-Weight Gravimetric* FEEDER handles any dry material, including Ferrisul.

OMEGA MACHINE COMPANY

(Division of Builders Iron Foundry)

61 CODDING ST., PROVIDENCE 1, R. I.

OMEGA PRODUCTS

Volumetric Feeders • Gravimetric Feeders • Solution Feeders • Lime Slaking Equipment • Bucket Elevators • Laboratory Stirrers.

HYDRO-TITE

AND DRY BRAIDED FIBREX

A DEPENDABLE SELF-CAULKING JOINT COMPOUND FOR CAST IRON BELL AND SPIGOT WATER MAINS

HYDRO-TITE is a self-caulking sulphur base jointing compound used to joint bell and spigot cast iron water mains and soil pipe. It comes in powder form which insures uniformity and quick melting.

When poured into a joint, HYDRO-TITE immediately solidifies upon contact with the metal and bonds to both the surfaces of the bell and the spigot for the entire depth of the joint. It requires no caulking and after pouring a joint, water pressure may be immediately applied.

HYDRO-TITE is easy to use, no skill being required to make joints that are tight from the start. Joints made with HYDRO-TITE will stand any pressure the pipe will stand.

DRY BRAIDED FIBREX

USED LIKE BRAIDED JUTE WILL NOT BREED BACTERIA

A SANITARY Packing used in jointing bell and spigot pipe for water, sewer mains and soil pipe.

FIBREX was designed for use with Hydro-Tite and other self-caulking compounds, but is entirely suitable also for joints made with lead, and for Sani-Tite and other asphalt sewer joint compounds. Thousands of pounds of Fibrex are already in service on water lines throughout the country.

HYDRAULIC DEVELOPMENT CORPORATION

Main Sales Office: 50 CHURCH STREET, NEW YORK 7, N. Y.

Works: WEST MEDFORD STATION, BOSTON 56, MASS.

(*Continued from page 14*)

Milton F. Abrams, Assistant District Manager, Wailes Dove-Hermiston Corp., New York, who had been on leave of absence from his position for several months, died at his home in Lynbrook, N.Y., on November 26, 1946, at the age of 47.

Abrams joined the Wailes Dove-Hermiston organization in 1930 as a stenographer, but served most of his sixteen years with the company as assistant manager of the New York district office, doing work on corrosion prevention in water works and sewerage projects in that area. An Active Member of the Association for the past ten years he was known to the members for his numerous published articles on corrosion prevention.

Herbert E. Hudson Jr., formerly Filtration Engr. at Chicago's South District Filtration Plant, has been appointed Chief Engr. of the Illinois Water Survey, replacing Charles O. Reinhardt, who resigned recently to accept a regular commission as a Commander in the Navy. Hudson assumes his new duties with a background of long experience in water works design and operation. He is well known to Illinois water works men, having served for a number of years as Secretary of A.W.W.A.'s Illinois Section.

W. M. Franklin has returned to his position as San. Engr. & Supt. of Water & Sewage Treatment Plants, Charlotte, N.C., after three years in the Army. As a Major in the San. Corps, he served for a period as Chief of the Sanitation Branch, Camp Shelby, Miss., and then went overseas to duty on Leyte, Cebu and Luzon.

Franklin, who has been on the staff of the Charlotte Water Dept. since 1936, previously was Chief Chemist at the Durham, N.C., Water Dept. and Asst. Engr. with William M. Piatt, Cons. Engrs.

(*Continued on page 18*)

NATIONALLY APPROVED APPLICATORS OF ANTI-RUST AND ANTI-CORROSIVE COATINGS FOR ELEVATED TANKS, STAND PIPES, PENT STOCKS AND OTHER WATER WORKS INSTALLATIONS. **NO-OX-ID, BARRETT'S** AND OTHER APPROVED PROTECTIVE COATINGS APPLIED BY EXPERTLY TRAINED MEN.

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FREE LITERATURE

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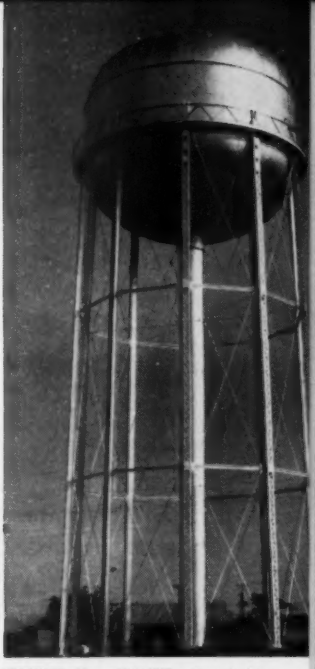
New York Representative, telephone Chelsea 2-1676—Alfred Conhagen, Inc., 429 W. 17th St., N.Y.C.

CABIN JOHN, Md.—500,000 gallon toroidal bottom tank, 60' diameter, on 100' tubular column tower.

ARLINGTON COUNTY, Va.—500,000 gallon toroidal bottom tank, 60' diameter, on 81' tubular column tower



MISSION, Tex.—500,000 gallon double-ellipsoidal tank, 50' diameter, on 100' tower.

YOU GET EVERY MODERN ADVANTAGE IN BETTER WATER SERVICE FOR YOUR COMMUNITY, WITH...

ELEVATED STEEL TANKS by Pittsburgh-Des Moines

These progressive municipalities are among the many now benefiting by new Pittsburgh-Des Moines' Elevated Tank installations—realizing improved water storage with maximum efficiency and economy. *Write for our descriptive Brochure!*

WINDOM, Kan.—300,000 gallon double-ellipsoidal tank, 42' diameter, on 75' tower.

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NEW YORK, ROOM 921, 270 BROADWAY · CHICAGO, 1228 FIRST NATIONAL BANK BUILDING

DALLAS, 1229 PRAETORIAN BUILDING · SAN FRANCISCO, 631 RIALTO BUILDING

SEATTLE, 532 FIRST AVENUE, SOUTH

(*Continued from page 16*)

Dresser Mfg. Div. has announced the appointment of Elton E. Peavy as Southwest Dist. Mgr. for the sale of Dresser products to the water industry. Peavy, who had a wide acquaintance in the water works field before joining the Dresser organization, will supervise an area including Texas, Louisiana, Oklahoma, Arkansas, Mississippi and New Mexico.

John B. C. Muddiman recently joined the engineering staff of the E. I. du Pont de Nemours & Co., Inc., Industrial Engineering Div., Wilmington, Del., upon his release from active duty as a Captain in the Army San. Corps. In service since July 1943, Muddiman served in New Guinea, the Philippines, Japan and Korea. Prior to that time he was in charge of water purification at Kingston and Catskill, N.Y.

William A. Moggio recently accepted a position as Research Assoc. with the Louisiana State Univ. Eng. Expt. Station, Baton Rouge, where he will devote his effort to a study of methods of treatment of sulfate pulp mill wastes under a fellowship sponsored by the National Council for Stream Improvement. Prior to accepting the fellowship, Moggio had worked for the National Council as Southern Field Engr.

(*Continued on page 20*)

FORD YOKES

With the trend more strongly than ever toward greater accuracy and more frequent testing, the easy and trouble-free accessibility of a water meter set in a Ford Yoke makes this proven and perfected setting device most worth while.

Catalog sent for the asking.

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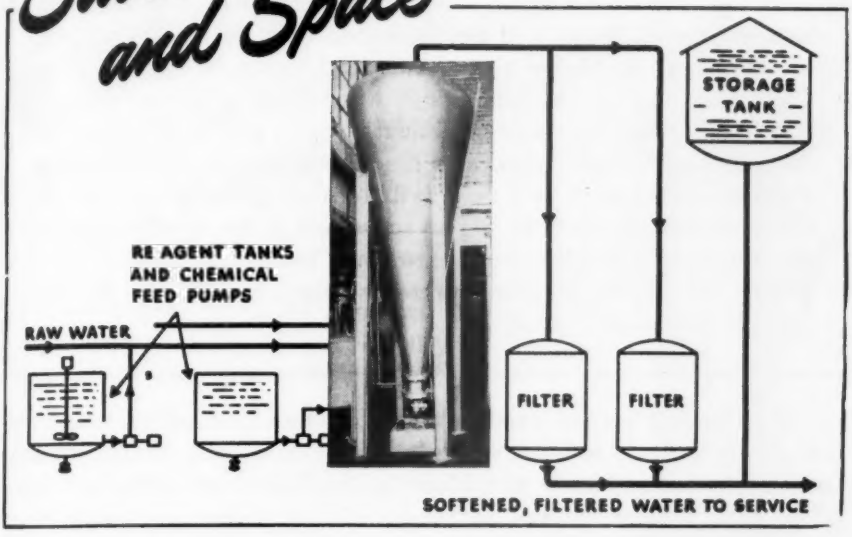
Saves time and Space



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Permutit's Spiractor—latest addition to modern cold lime or lime soda water treatment—operates on the principle of intimate contact with solid nuclei for accelerated precipitation. The conical container—itself a great saving in space over other type systems—is more than half filled with fine granules of calcium carbonate catalyst. Hard water and lime soda precipitant enter at bottom, mix at once, flow upward through catalyst bed. This tangential inflow gives a rising swirling motion that greatly speeds softening reaction by affording immediate contact between chemically treated water and suspended granules.

Precipitated hardness deposits on the surface of these granules which increase in size. There is no watery sludge; the enlarged granules are readily disposed of like moist sand grains. Detention period of the Spiractor is only five to ten minutes.

For more information write the Permutit Company, Dept. JA2, 330 West 42nd St., New York 18, N. Y. or Permutit Co, of Canada, Ltd., Montreal.

* Trademark Reg. U. S. Pat. Off.

PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 18*)

Guy Paul Clow, Vice-President of James B. Clow & Sons, died suddenly at his home in Coshocton, Ohio, on October 30, 1946. He was 61 years of age.

Clow joined the James B. Clow & Sons organization in 1913 and became General Manager of the Coshocton Plant in 1932. In 1945, he was placed in charge also of the neighboring Newcomerstown, Ohio, Plant and on October 8, 1946 was elected to vice-presidency.

Clow's connection with the manufacture of pipe and fittings for the water works field began at a time when pipe at the Coshocton Plant was being made by a new "bell-down" English system. From that time until his death he had an active part in the improvement of manufacturing processes which saw the "bell-down" method supplanted first by the pit cast process and then, in 1935, by the de-Lavaud centrifugal method.

Max Levine has returned to his old post as Prof. of Bacteriology, Iowa State College, and Bacteriologist of the Iowa Eng. Expt. Station. Ordered into active service as a Major in the Army San. Corps two days before Pearl Harbor, he was stationed at Brooke General Hospital, Fort Sam Houston, Tex., for almost five years, being released at the rank of Colonel.

At the hospital, Levine had an opportunity not only to serve as Officer in Charge of the Bacteriology Lab. Sec. of the Clinical Service but to do some investigational work on penicillin, streptomycin, serological tests for bacillary dysentery and consultation on some aspects of water and sewage purification. His activities there also included the organization and presentation of a lecture series on sanitary bacteriology and the preparation of numerous articles on his work for publication in technical journals.

(*Continued on page 22*)

ZECO GREENSAND ZEOLITE

ZECO and HI-ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

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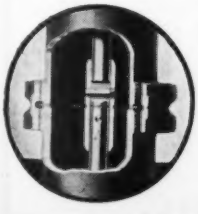
After a Kennedy SAFETOP has once been installed in the ground with a firm well-packed fill, the necessity for later excavation is remote indeed.

All operating parts are accessible from above the ground for adjustment and maintenance attention . . . and incidentally, but little attention is required because of the simple, sturdy, straight-line mechanism and the durable valve facings.

Even in the event of breakage by a colliding vehicle, no excavation is necessary to return the hydrant to service. This is because of the famous Safety Breakable Section, located a few inches above the ground level. If a Kennedy SAFETOP is struck by a smashing impact, this section breaks cleanly apart, thereby protecting the major parts of the hydrant from damage. No excavation is required for repairs, and the hydrant can be returned to service by one man, well within half an hour, and at a total cost of less than $10 for both material and labor. Bulletin describing the Kennedy SAFETOP will be sent on request.



THE KENNEDY VALVE MFG. CO.
ELMIRA, N. Y.

KENNEDY *Safetop* HYDRANT

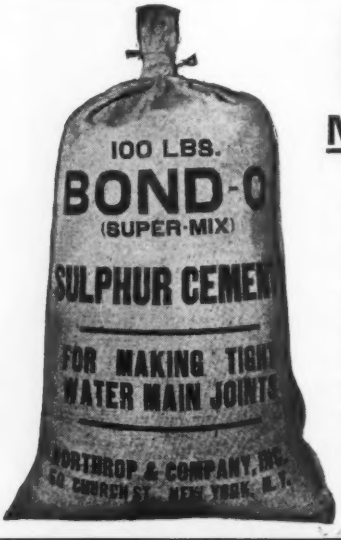
(*Continued from page 20*)

Stuart-Brumley Corp. has issued a new bulletin describing the "Palmer Filter Bed Agitator." Included in the publication are specifications and operating instructions, installation views, engineering data and a list of installations. Copies may be obtained by requesting Tech. Pub. No. 38 from the company's office at 516 N. Charles St., Baltimore 1, Md.

A. M. Buswell, Chief of the State Water Survey Div., Urbana, Ill., was recently awarded the Army Commendation Ribbon by Maj. Gen. Alden H. Waitt, USA, Chief of the Chem. Warfare Service, with the following citation:

"Maj. Buswell, as Chief, Water Chemistry Sec., Medical Div., Chem. Warfare Service, Edgewood Arsenal, Md., from June 1943 to December 1944, rendered exceptionally meritorious service and made outstanding contributions to the research program of the Medical Div. Maj. Buswell, by his productive and intelligent efforts, was instrumental in developing kits for use in the detection of toxic chemical agents in water. He was very active in the determination of the best methods for purification of water contaminated by chemical agents and was an instructor for the Chemical Warfare School on that subject. The services rendered by Maj. Buswell reflect the highest credit on himself and the Armed Forces of the United States."

(*Continued on page 24*)



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(*Continued from page 22*)

Abraham M. Bowman, for more than 30 years Supt. of Public Utilities at Elmira, Ont., resigned from his position on February 1, giving as a reason his advanced age, which he felt disqualified him from facing the present chaos of shortages, conservation and rationing in the industry. He will undoubtedly continue to serve the utilities commission in an advisory capacity when a successor has been appointed.

Bowman, who became an Active Member of the A.W.W.A. in 1919, was awarded the Canadian Section George Warren Fuller Award in 1939 for his exemplary administration of the Elmira water system.

Mathieson Alkali Works, Inc., New York, has announced the election of D. W. Drummond and Arthur T. Bennett as vice-presidents. Drummond, who joined the organization in 1938 and has worked in various sales supervisory positions since then, will take over the duties of Vice-Pres.–Gen. Mgr. of Sales. Bennett, whose experience with the company since 1933 resulted in his appointment as Gen. Mgr. of Operations in 1943, will keep that title in addition to his new designation as Vice-Pres.

(*Continued on page 44*)

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All necessary equipment for both chlorine and pH tests in a compact, flexible unit for use in laboratory or field work. Can be supplied to hold from 2 to 8 sets of color standards, with corresponding indicator solutions and necessary glassware. Any desired part of both the chlorine and pH ranges may be covered. Unit can also be equipped with O-Tolidine-Arsenite Reagent if desired. Applicable to all types of research and industrial pH and chlorine control work. Prices vary according to size and range covered. Write for information and reports.

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Anders, Willard W., Plant Mgr., Filter Plant, Douglasdale Rd., Richmond 21, Va. (Jan. '47)

Anderson, Alfred B., Asst. Engr., Newark Div. of Water, 1293 McBride Ave., Little Falls, N.J. (Jan. '47)

Barnes, John R., Repr., Neptune Meter Co., 1011—1st Ave., E., Oskaloosa, Iowa (Jan. '47)

Bickelhaupt, W. V., Pres., Bickelhaupt, Inc., 1737 Summit Ave., Richmond 21, Va. (Jan. '47)

Bjork, Wilbur E., Service Dept., Water Works, 1003 Locust St., Des Moines 7, Iowa (Jan. '47)

Blain, J. S., Exec. Pres., Duarte Mutual Irrigation & Canal Co., 1015 Buena Vista, Duarte, Calif. (Jan. '47)

Boyles, X. P., Public Health Engr., State Dept. of Health, 1614—13th Ave., N., Fort Dodge, Iowa (Jan. '47)

Brandon, Oliver K., Elec. Repairman, Wichita Water Supply, 251 N. Grove, Wichita 7, Kan. (Jan. '47)

Brewster, John H., Dist. San. Engr., State Dept. of Health, 217 Lark St., Albany, N.Y. (Jan. '47)

Bryant, Edward K., Assoc., Knappen Eng. Co., 280 Madison Ave., New York, N.Y. (Jan. '47)

Bunnell, E. F., Mgr., Kellogg Power & Water Co., 319 Main St., Box 636, Kellogg, Idaho (Jan. '47)

(*Continued on page 30*)

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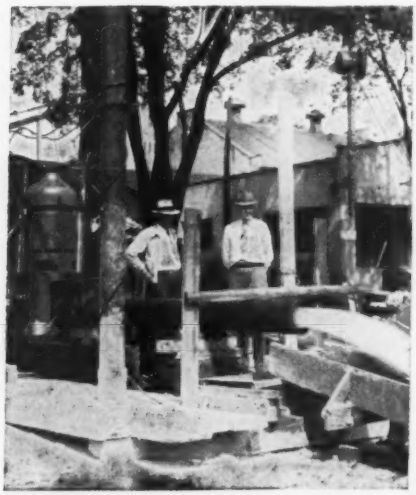

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(*Continued from page 28*)

Burrow, L. R., *see* Raymondville, City of

Caldwell, T. A., *see* Truehart & Caldwell

California Dept. of Public Health, Frank M. Stead, Library, 668 Phelan Bldg., 760 Market St., San Francisco 2, Calif. (Corp. M. Jan. '47)

Carnahan, R. D., Plant Operator, Water Treatment Plant, 609—33rd St., Bradenton, Fla. (Jan. '47)

Cockrell, Alton P., Chief Operator, Birmingham Industrial Water Supply System, 1913—4th Ave., N., Birmingham 3, Ala. (Jan. '47)

Collins, W. L., Repr., Viking Supply Co., 2625 Elm St., Dallas, Tex. (Jan. '47)

Community Public Service Co., W. V. Coursey, Mgr., Memphis, Tex. (Corp. M. Jan. '47)

Coursey, W. V., *see* Community Public Service Co. (Memphis)

Croskey, J. W., Supt. & Supervisor, City Water Dept., Tama, Iowa (Jan. '47)

Dahout, Jule, Supt., Tract No. 180 Water Co., 4544 E. Florence Ave., Cudahy, Bell, Calif. (Jan. '47)

Fuller, R. P., Mgr., California Domestic Water Co., 2505 E. Whittier Blvd., Whittier, Calif. (Oct. '46)

Harmstad, Frank C., Sales Mgr., Hydrant & Valve Dept., R. D. Wood Co., 1072 Public Ledger Bldg., Philadelphia 5, Pa. (Jan. '47)

Harris, W. N., *see* McAllen Public Utilities

Jeffrey, Roy, Purchasing Agent, Purchase Stores & Traffic Dept., Metropolitan Utilities Dist., 18th & Harney Sts., Omaha, Neb. (Jan. '47)

Johnson, Paul H., Supervisor of Mech. Eng., Indianapolis Power & Light Co., 417 N. Arsenal Ave., Indianapolis, Ind. (Jan. '47)

Jones, William C., Div. Engr., Bureau of Eng., 110 Cherry St., Toledo 4, Ohio (Jan. '47)

Knechtges, O. J., Civ. Engr., Mead & Hunt, 550 State St., Madison 3, Wis. (Oct. '46)

Kuecker, Alvin J., Supt., Maint. & Distr. System, Water Dept., City Hall, Elgin, Ill. (Jan. '47)

Kysar, J. P., Gen. Mgr., K. W. Eng. Co., 3310 S. 27th St., Lincoln, Neb. (Jan. '47)

(*Continued on page 32*)

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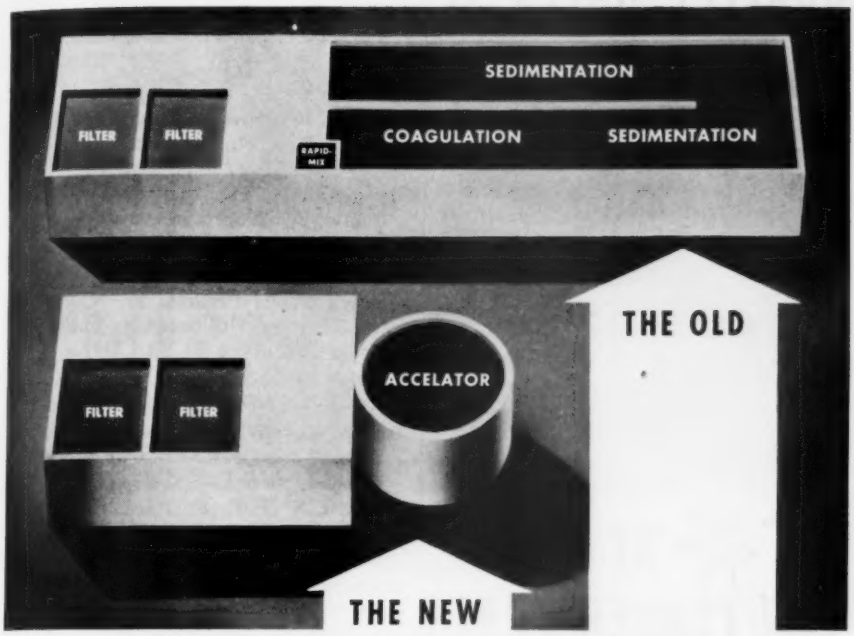

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(Continued from page 30)

Lee, George S., Chemist, Water Works, 310 S. Wapello St., Ottumwa, Iowa (Jan. '47)

Lee, William Boyd, Mech. Designer "B," Water Dept., Southern Pacific R.R., 65 Market St., San Francisco, Calif. (Jan. '47)

Mace, H. F., *see* Mexia, City of

Maloney, John R., Chemist, Water Works, 1003 Locust St., Des Moines 7, Iowa (Jan. '47)

Marquardt, A. H., Well Drilling Contractor, Box 793, Haines City, Fla. (Jan. '47)

Mason, George E., *see* Wolcott, Village of

McAllen Public Utilities, W. N. Harris, Gen. Mgr. of Utilities, City Hall, McAllen, Tex. (Corp. M. Jan. '47)

McBride, Francis, Well Driller, R.F.D. No. 5, Box 509, Tampa, Fla. (Jan. '47)

Merrill, Reynold C., Research Chemist, Philadelphia Quartz Co., 121 S. 3rd St., Philadelphia 6, Pa. (Jan. '47)

Mexia, City of, H. F. Mace, City Mgr., Water Dept., Mexia, Tex. (Corp. M. Jan. '47)

Myrberg, Karl G., Sales Engr., Pittsburgh Equitable Meter Co., 448 E. Gray St., Des Moines, Iowa (Jan. '47)

Nelson, U. Ernest, Cons. Engr., 603 Builders Exchange Bldg., Portland 4, Ore. (Jan. '47)

O'Hara, Alexander Stuart, Provincial San. Inspector, Ontario Dept. of Health, Box 905, Kenora, Ont., Can. (Jan. '47)

Porter, Oscar S., Jr., Dist. Engr., Wallace & Tiernan Co., 815 Braniff Bldg., Oklahoma City 2, Okla. (Jr. M. Jan. '47)

Rafter, Howard E., Supt. of Filtration, Water Dept., 1973 E. Davison Ave., Detroit 12, Mich. (Jan. '47)

Raymondville, City of, L. R. Burrow, City Mgr., Water Dept., Raymondville, Tex. (Corp. M. Jan. '47)

Read, Ivan E., Supt. of Production, Iowa Valve Co., Oskaloosa, Iowa (Jan. '47)

Remus, Gerald, Chief Water Pumping Plant Engr., Dept. of Water Supply, 8565 Mendota, Detroit 4, Mich. (Jan. '47)

Renner, Lyal G., Operating Engr., Public Service Com., 601 Barrington St., Halifax, N.S., Can. (Jan. '47)

(Continued on page 34)

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(*Continued from page 32*)

Riepe, Gerald E., Director, Div. of San. Eng., State Health Dept., 720 Boston Bldg., Denver, Colo. (Jan. '47)

Santagata, John T., Engr.-Draftsman, Mahoning Valley Sanitary Dist., Box 298, Youngstown 1, Ohio (Jan. '47)

Shultz, Robert H., Pres., Shultz & James, Inc., 7 N. 6th St., Richmond 19, Va. (Jan. '47)

Stead, Frank M., *see* California Dept. of Public Health

Stoakesberry, Roy R., Water Works Operator, Water Works, Bloomfield, Iowa (Jan. '47)

Stockton, R. L., Mgr.-Owner, Arvin Water Co., Box 333, Arvin, Calif. (Jan. '47)

Thompson, H. E., *see* Washington Elec. & Water Dept.

Trahern, J. W., Supervising Civ. Engr., East Bay Municipal Utility Dist., Box 720, Oakland, Calif. (Jan.'47)

Truehart & Caldwell, T. A. Caldwell, Partner, Utility Contractors, 509 American Hospital & Life Insurance Bldg., San Antonio 5, Tex. (Corp. M. Jan. '47)

Vogt, John E., San. Engr., Bureau of Eng., State Dept. of Health, Lansing, Mich. (Jan. '47)

Voigt, Otto D., Sr. Civ. Engr., U.S. Engr. Office, 1st & Douglas Sts., N.W., Washington, D.C. (Jan. '47)

Wannoni, Luis, Chief Engr., Div. of San. Eng., Ministerio de Sanitarias y Asistencia Social, Sur 4 No. 87, Caracas, Venezuela, S.A. (Jan. '47)

Washington Elec. & Water Dept., H. E. Thompson, Supt., Market St., Washington, N.C. (Corp. M. Jan. '47)

(*Continued on page 36*)

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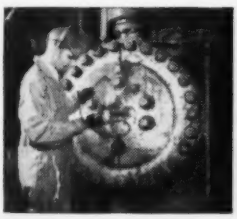

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(*Continued from page 34*)

Weitzel, William H., Service Engr., Calgon, Inc., 2512 Book Bldg., Detroit, Mich. (Jan. '47)

Wells, C. C., Owner & Mgr., Soft Water Service of Denver, 511 Broadway, Denver, Colo. (Jan. '47)

West University Place, City of, J. L. Williams, City Engr., Dept. of Water, 3800 University Blvd., Houston 5, Tex. (Corp. M. Jan. '47)

Williams, J. L., *see* West University Place, City of

Wolcott, Village of, George E. Mason, Treas., Water Dept., Wolcott, N.Y. (Corp. M. Jan. '47)

Yost, E. B., Salesman, Johns-Manville Corp., 2107 Griffin St., Dallas, Tex. (Jan. '47)

Young, Harold C., Chemist, Wichita Water Supply, 1435½ Burns, Wichita 3, Kan. (Jan. '47)

REINSTATEMENT

Bowne, Sidney M., 222 Front St., Mineola, N.Y. (May '24)

LOSSES

Deaths

Erickson, Wendell J., Asst. San. Engr., Div. of Sanitation, State Dept. of Health, 217 Lark St., Albany 6, N.Y. (Jan. '24) *P*

Inglee, Clinton, Pres. & Gen. Mgr., National Water Main Cleaning Co., 50 Church St., New York 7, N.Y. (July '35) *Director '38–41, '42–45.*

Taylor, Herbert R., Office Engr. & Designer, Joseph E. Bonadiman, Civ. Engr., 1709 W. 8th St., Los Angeles 14, Calif. (Oct. '44)

Travis, F. M., Chairman of the Board, Torrington Water Co., Box 87, Torrington, Conn. (July '17)

Woodhouse, H. M., City Engr., City Hall, Donald St., Fort William, Ont., Can. (Jan. '44)

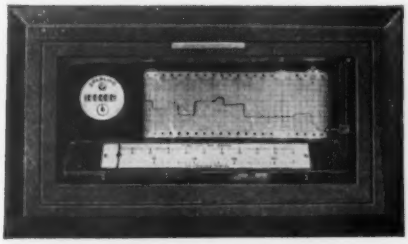
Resignations

Bonn, George S., Research Engr., City Water, Light & Power Dept., City Hall, Springfield, Ill. (Jan. '40)

Pingree, L. W., Wallace & Tiernan Co., Inc., 12 Minna St., San Francisco 5, Calif. (Apr. '42) *P*

(*Continued on page 38*)

SPARLING MAIN-LINE METERS



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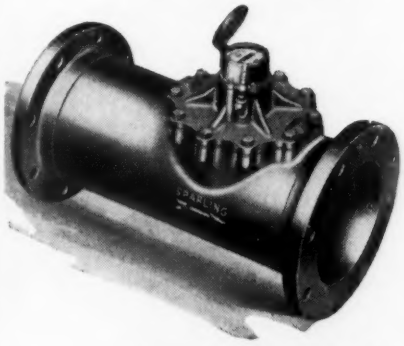

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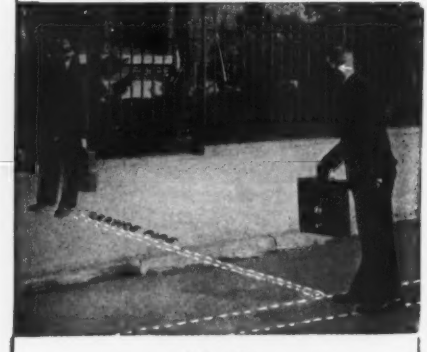

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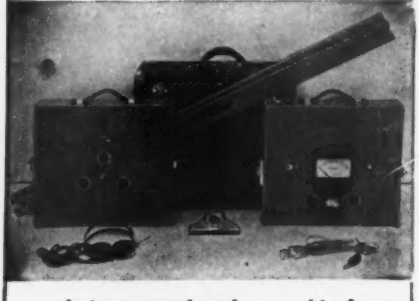

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(*Continued from page 36*)

Changes in Address

Changes received between December 5, 1946 and January 5, 1947

Alizo, Antonio, Constr. Engr., Instituto Nacional de Obras Sanitarias, Valera, Estado Trujillo, Venezuela, S.A. (Oct. '43)

Bentley, Ralph E., Secy.-Treas., Passaic Valley Water Com., Box 2180, Paterson 21, N.J. (Apr. '43) *A*

Bonyun, Richard E., Gen. Supt., Passaic Valley Water Com., Box 2180, Paterson 21, N.J. (Oct. '35) *M*

Booker, Warren H., Maj., Eng. Div., Box 711, Santa Fe, N.M. (Dec. '31) *P*

Boyd, Byron, Col., 218 Kennedy Drive, Kenwood, Chevy Chase 15, Md. (July '24) *MP*

Bradley, J. F., Chief Engr., R.F.D. No. 5, Valparaiso, Ind. (Feb. '21) *Life M. MP*

Butler, T. C., Jr., Chief Engr., Route 5, Boise, Idaho (Jan. '40)

Calderara, O. J., Chief Engr., Suburban Tampa San. Dist., 705 Madison St., Tampa 2, Fla. (Oct. '40)

Caplan, Louis R., Calgon, Inc., 1007 Sligo Pkwy., Takoma Park, Md. (Oct. '39)

Charbonneau, T., 946 E. McDonald, Lakeland, Fla. (Jan. '45)

Chicago Pump Co., Milton Spiegel, Vice-Pres. & Gen. Mgr., 2300 Wolfram St., Chicago 18, Ill. (Assoc. M. Jan. '40)

Clark, Everett L., Hydr. Engr., Donald R. Warren Co., 1112 E. Palm Ave., San Gabriel, Calif. (Oct. '39) *M*

Cole, Edward S., 133 Bellevue Ave., Upper Montclair, N.J. (June '02) *Honorary M. '43. M*

Collins, W. D., Chemist, Box 284, Benjamin Franklin Station, Washington 4, D.C. (Dec. '25) *P*

Deighton, John T., Comr. & Pres., Passaic Valley Water Com., Box 2180, Paterson 21, N.J. (Oct. '43) *AM*

Drake, Chester F., Supt., Filtration Div., Bureau of Water, 226 Delafield Ave., Pittsburgh 15, Pa. (Apr. '10) *Fuller Award '41. MP*

Eby, Roger I., Engr., 899 Delmar Ave., Alameda, Calif. (Oct. '46)

(*Continued on page 40*)

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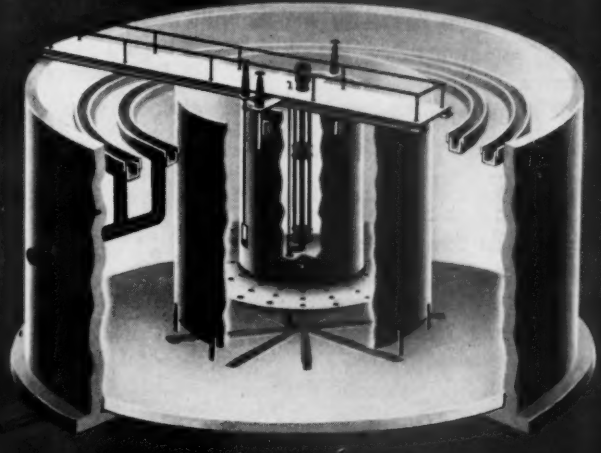

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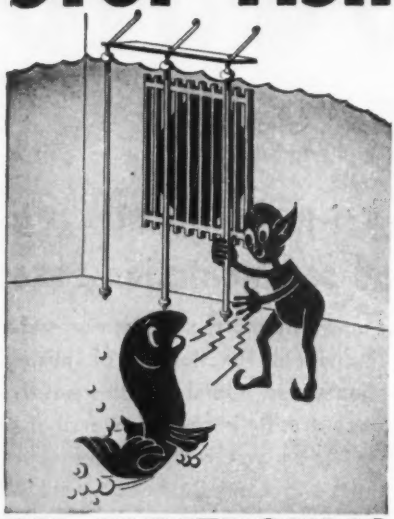

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(*Continued from page 38*)

Fox, Charles L., 5260 Center Ave., Pittsburgh 6, Pa. (June '12) *Fuller Award '46. MP*

French, E. V., 20 School St., Andover, Mass. (July '06)

Green, Richard S., U.S. Public Health Service, 19th St. & Constitution Ave., Washington 25, D.C. (Jan. '42)

Griswold, Harold S., San. Engr., Southwestern Branch Office, State Board of Health, 400½ E. Van Trees St., Washington, Ind. (Jan. '43)

Hale, Frank E., Box 452, Southern Pines, N.C. (May '08) *Goodell Prize '35. Honorary M. '44. P*

Hanson, Arthur M., 12 Bartlett St., Malden 48, Mass. (Oct. '43) *P*

Hopkins, E. W., 533 Gladstone Blvd., Kansas City 1, Mo. (Jan. '37) *M*

Houser, George C., Editor, New England Water Works Assn., 220 Clyde St., Brookline 67, Mass. (Nov. '25) *P*

Hughes, H. D., R.F.D. No. 7, Box 331, Dallas 6, Tex. (Jan. '42)

Janzen, Herman A., Asst. San. Engr., State Board of Health, 2200 Main, Parsons, Kan. (Apr. '46)

Jodaitis, Ladislaus T., Sr. Asst. Engr. (R), U.S. Public Health Service, 4325 Chamberlayne Ave., Richmond, Va. (July '43) *P*

Kegebein, John F., Jr., 742 Washington Park B-5, Norfolk 7, Va. (Apr. '41) *MP*

Keinath, William J., Engr., Calgon, Inc., 18 E. 4th St., Cincinnati 2, Ohio (July '41)

Kimball, Clyde L., Field Supt., Water Dept., 303 N. Elm Drive, Beverly Hills, Calif. (Oct. '43) *M*

King, Elizabeth D. (Miss), 318 N. Claybrook, Memphis 7, Tenn. (Jan. '46) *P*

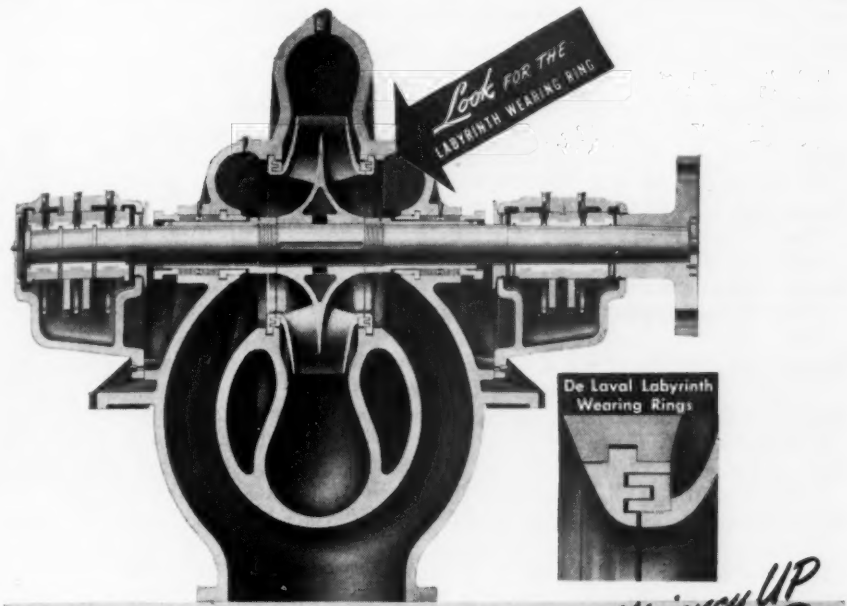
King, Leslie R., Mgr., Water Dept., 403 E. Snyder, Hobbs, N.M. (Oct. '46)

Klang, Marvin, Dept. of Purchases & Supplies, Water Board Bldg., Detroit 26, Mich. (Affil. July '41) *MP*

Knodel, Adolph Robert, Prof. Scientific Asst. Grade III, State Water Survey Div., 416 1st National Bank Bldg., Peoria 2, Ill. (July '45) *MP*

Lauramore, Horace H., Salesman, Johns-Manville, 319 Graham Bldg., Jacksonville 2, Fla. (Oct. '42)

(*Continued on page 42*)



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(*Continued from page 40*)

Leary, Charles J., Route No. 3, Greenfield, Ind. (Oct. '45)

Leland, Raymond I., San. Engr., 820 W. Sheridan Rd., Chicago 13, Ill. (Jan. '39)

Lingnor, Larry H., Salesman, 22 W. Maple St., Chicago 10, Ill. (Apr. '42) *AMP*

Logan, Kirk H., Special Repr., Cast Iron Pipe Research Assn., Bureau of Standards, Washington 25, D.C. (July '44) *M*

Lozier, William S., Cons. Engr., 2230 Clover Rd., Rochester 10, N.Y. (July '35)

Lurvey, Donald T., Chemist, Texoma Natural Gas Co., Fritch, Tex. (Jan. '43)

Maffitt, M'Kean, Box 274A, Route No. 3, Wilmington, N.C. (Dec. '22) *M*

Maggs, Percy J., Water Works Supt., Witaskwin, Alta., Can. (Jan. '37) *MP*

Miller, Frank H., Asst. Engr., Bureau of San. Eng., Essex Bldg., Bank & Plume Sts., Norfolk 10, Va. (Apr. '42) *P*

Millis, John B., Engr., State Water Survey Div., 1955 E. 73rd Pl., Chicago 49, Ill. (July '45)

Moerk, Frank M., Cons. Chem. Engr., 1301 Chelten Ave., Philadelphia 26, Pa. (July '40) *P*

Montgomery, John Gilmour, 1912—16th St., N.W., Washington 9, D.C. (Oct. '43) *M*

Morrison, H. H., 1835 Crestwood Drive, Chattanooga 2, Tenn. (July '35) *P*

Muhlitner, Walter, Supt., Water Treatment Plant, Ann Arbor, Mich. (Jan. '43)

New Mexico Public Service Co., M. C. Heffelman, Div. Mgr., Santa Fe, N.M. (Corp. M. Mar. '24)

Ogden, John B., Asst. Engr., Passaic Valley Water Com., Box 2180, Paterson 21, N.J. (July '38) *M*

Olson, W. M., 436 Normal Pkwy., Chicago 21, Ill. (Apr. '26) *P*

Pettit, Charles G., 587 W. Ford Ave., Barberton, Ohio (Oct. '46)

Rheem Mfg. Co., R. M. Thomas, Research Div., 4004 E. Monument St., Baltimore 5, Md. (Corp. M. Apr. '43)

Rose, Joseph L., 1104 Brummel, Evanston, Ill. (Jan. '42)

Secker, William M., Jr., Asst. Engr., Passaic Valley Water Com., Box 2180, Paterson 21, N.J. (Apr. '43) *M*

Shillinger, William D., Northwestern Branch Office, State Board of Health, 55 S. Franklin St., Valparaiso, Ind. (Oct. '44)

Smith, David B., Milton, Fla. (Jan. '46) *AMP*

Souder, Byron N., 20 W. 36th St., Kansas City 2, Mo. (Jan. '43) *AMP*

Stokes, Thomas M., Mgr. of Utilities, Box 737, Pittsburg, Tex. (Oct. '43)

Stolp, Amer C., Dist. Mgr., Northern Dist., California Water Service Co., Box 1109, Marysville, Calif. (Nov. '33)

Tarlton, Ellis A., 34 Pleasant St., Danbury, Conn. (Apr. '39) *P*

Treanor, Earl E., 6433 Charlotte, Kansas City 5, Mo. (Jan. '44)

Van Pelt, Richard, 1604 Broadway, Salem, Ore. (Apr. '43) *MP*

Vaseen, V. A., San. Engr., 3110 Vrain St., Denver 12, Colo. (Jan. '44) *P*

Waters, Leslie W., Capt., SnC, AUS, Station Hospital, TAAF, 1 Charles St., New Hampshire, Pa. (July '46)

Wells, W. P., Supt., Filtration Plant, Water Dept., 1110 N. Washington St., Aberdeen, S.D. (July '39) *MP*

Wild, Harry E., Chief Engr., Russell & Axon, Inc., Cons. Engrs., Box 1431, Daytona Beach, Fla. (July '46)

Williamson, Joe, Jr., Vice-Pres., Russell & Axon, Inc., Cons. Engrs., Box 1431, Daytona Beach, Fla. (July '40) *P*

Zaghloul, Hassan Farid, Civ. Eng. Dept., Univ. of Illinois, Urbana, Ill. (Apr. '46) *AMP*

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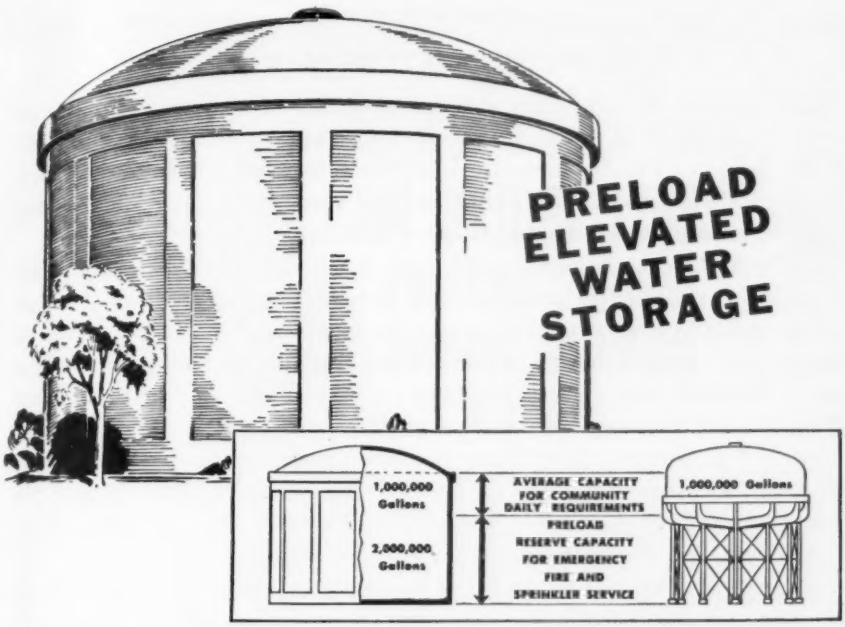

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(*Continued from page 24*)

CALIFORNIA SECTION MEETING

A total of 857 members and guests gathered at San Francisco on October 22–25, 1946, to make the first postwar conference of the California Section a rousing success. In addition to a full two and a half days of technical sessions, a golf tournament and three evenings of dinners and entertainment provided the registrants with a full schedule of activities.

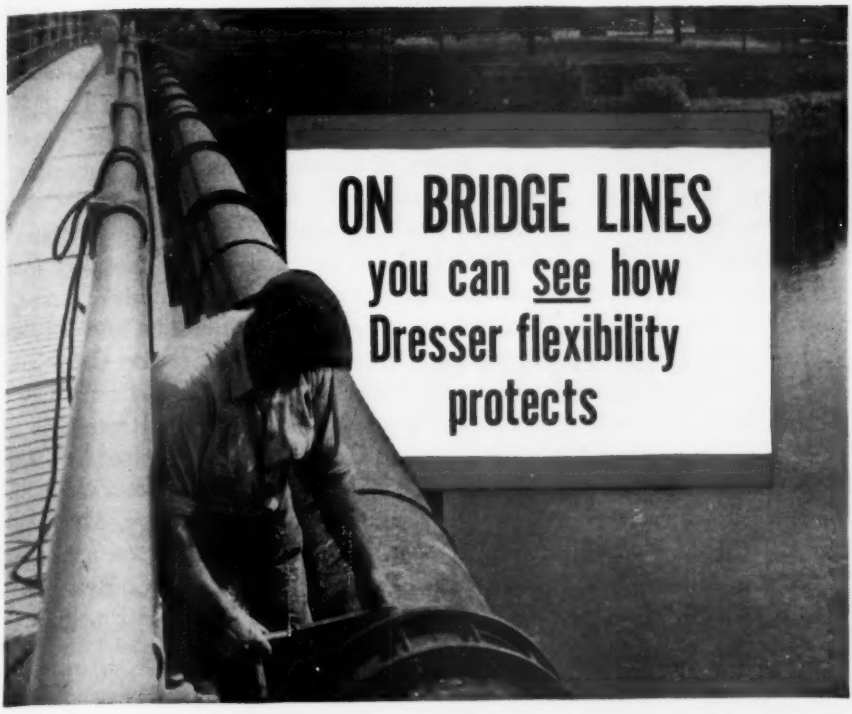
The technical sessions opened with a talk by Edward Hyatt, State Engr., who reviewed the state's water development program as a whole, giving special attention to problems in the central valley and the Colorado River area. In conclusion, he pointed out that the possibility of an acute water shortage already faces Southern California, and may in the not too distant future become a very serious problem.

Fred J. Grumm, Asst. State Highway Engr., spoke next on "State Highway Expansion and Its Effect on Public Utilities," stating that the discussion and frequent misunderstanding of state policy on freeway locations in relation to utility lines was raising a "tempest in a teapot." According to Grumm, estimates of cost for relocating utility facilities in some instances are far out of line. Freeway construction will necessarily be gradual and, therefore, should not produce a sudden load of new costs. Once a freeway is built, it is almost impossible to stop the flow of traffic for the relocation of utilities. On occasion, the state has moved sewers at its own expense and has generally charged the utility only when it was one of proprietary nature. His conclusions were that the physical limitations imposed by the state seem not to be of so much concern as the question of who pays the costs. In the round table discussion on Friday afternoon, Grumm's paper was discussed by several utility men who apparently were not in very close agreement with his views.

In the absence of C. T. Waldo, Deputy City Atty., Los Angeles Dept. of Water & Power, his colleague, Deputy City Atty. Goodcell, read his paper, which dealt with the effect of Owens Lake litigation on water appropriation in California. The paper summarized the findings of the 1943 National Soda Products case by mentioning that: (1) one cannot be flooded out by a water appropriator in a haphazard manner; and (2) the decision requires all water appropriators to employ flood control facilities for excess capacity. Earlier these flood control measures were considered the responsibility of the state or federal agencies. The placing of flood control duties on water appropriators is a ruling that requires careful consideration.

Thursday morning's technical meetings were held in parallel sessions of the Purification and Plant Management Divs. The purification session opened with a paper entitled "Geochemical Changes in Ground Water Supplies" by Carl Wilson, Cons. Water Technologist of Los Angeles, who pointed out that the chemical characteristics of ground water on the coastal

(*Continued on page 46*)



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(*Continued from page 44*)

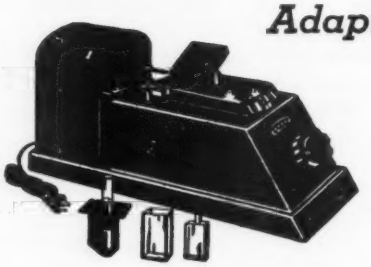
plain of California show marked variation in proceeding from the mountains to the sea, a distance of 25 to 40 miles. This paper will be published in the March issue of the JOURNAL, as will the papers entitled "The Role of Algae in the Corrosion of Open Steel Tanks," and "Studies in the Measurement of Tuberculation as an Index of Corrosion, and Anti-Corrosion Treatment Methods of Control," by Henry C. Myers, San. Engr., California Water & Telephone Co., Palm City, and E. W. Barbee, Water Purif. Engr., San Francisco Water Dept., respectively. Scheduled for early publication, too, are the papers presented by H. P. Wenrick, Assoc. Engr., Palo Alto, on "The Practical Cleaning and Rehabilitation of Wells"; N. J. Kendall, Engr. of Operations, California Water Service Co., San Jose, on "Waterproofing Concrete Structures"; and C. G. Ekstrom, Div. Mgr., Arizona Edison Co., Yuma, on "Yuma and the Colorado River."

Published in this issue of the JOURNAL are the papers presented by: W. R. Schneider, Asst. Engr., Pacific Gas & Electric Co.—"Economics of Pipeline Protection," p. 143; H. A. Knudsen, Engr. in Charge, Mech. & Elec. Div., East Bay Munic. Utility Dist.—"Booster Pumping on a Large Closed Aqueduct," p. 133; I. E. Flaa, Hydr. Engr., and W. C. Renshaw, Asst. Engr., San Francisco Water Dept.—"Rights of Way for Pipelines,"

(*Continued on page 48*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



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P. O. Box 887

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576 Wall St.

MAYAQUEZ, P. R.
Americo Rodriquez, Inc.
P. O. Box 749

(*Continued from page 46*)

p. 128; and G. L. Williams, California Water Service Co., San Jose—"Program for Routine Testing and Maintenance of Meters," p. 168.

Loren E. Blakely, Cons. Engr., Santa Ana, presented a paper on "The Use of Chlorine Dioxide at Montebello," describing the difficulties due to wastes from a plant manufacturing weed killer, employing 2,4-D, which was discharged into a sewer system and, after passage through an activated sludge plant, found its way into the ground water from which the supply of Montebello was delivered. He told how the highly objectionable taste, rendering the water practically unusable, was finally eliminated by the use of chlorine dioxide, although at a considerable expense.

T. V. Ackerman, Engr., Pasadena Water Dept., presented a paper on "Chlorination of Water Mains After Construction or Emergency Repairs," in which he stressed the importance of sterilizing new mains and those damaged as a result of storms or other causes. Ackerman went into considerable detail to describe the various methods of sterilizing both new and broken mains, concluding his remarks by giving figures on the necessary chlorine dosage and time required for proper sterilization.

Byron E. Doll, Deputy City Engr., Huntington Park, spoke on "Industrial Waste Disposal and Ground Water Resources," describing the Los Angeles underground basin and outlining the danger of various industrial wastes being allowed to percolate indiscriminately into underground waters. He included a brief description of the geology of the Los Angeles Basin and mentioned the tendency of most industries to locate in low tax areas, where little attention or control is given to methods of industrial waste water disposal. By several examples he showed that if injurious waste waters are permitted to percolate underground, the underground supplies may be permanently damaged. In discussing the paper, Frank M. Stead, Chief, Div. of Environmental Sanitation, State Dept. of Public Health, pointed out the necessity of public interest in what his department is attempting to do in preventing contamination of good water supplies by industrial waste waters at the source of pollution.

Just before the combined session on Thursday afternoon, Mayor Roger Lapham of San Francisco spoke briefly, welcoming the members to San Francisco and stressing the importance of water utilities in the life of the community. Blair I. Burnson, San. Engr., East Bay Munic. Utility Dist., Oakland, then told of the experience and practice of the district in reclaiming wash water from a rapid sand filter plant. Due to the tremendously expanded demand for water that developed during the war, it became necessary to conserve all possible water. Burnson described the method whereby approximately 1 mgd. used for filter plant wash water was reclaimed. The turbidity of 400 to 600 ppm. in the reclaiming basin was reduced to as low as 11 ppm. and returned to the raw water line. This operation to date has reclaimed approximately a half billion gallons of water.

(*Continued on page 50*)

another taste and odor problem solved by Mathieson Chlorine Dioxide!

Major C. Hagar

Water Superintendent Major C. Hagar of the City of Lawrence, Kansas, and his staff testify that the cost of Mathieson ClO_2 treatment is small considering its enthusiastic reception by consumers.

During January and February, 1946, melting snow and ice created especially unpleasant tastes and odors in the Kaw River, water supply for the City of Lawrence, Kansas. Yet, the Mathieson Chlorine-Chlorine Dioxide water treatment was able to cope with even that extreme condition.

Write Mathieson for details of this new technique. It's a development of interest to every water works superintendent. THE MATHIESON ALKALI WORKS (INC.), 60 East 42nd Street, New York 17, N. Y.

Chlorine Dioxide . . . Sanitation HTH Liquid Chlorine . . . PH-Plus (Fused Alkali) . . . Caustic Soda . . . Soda Ash Bicarbonate of Soda . . . Ammonia, Anhydrous & Aqua . . . Carbonic Gas Dry Ice . . . Synthetic Salt Cake . . . Sodium Chlorite Products . . . Sodium Methylate

Mathieson
CHLORINE DIOXIDE

(*Continued from page 48*)

He made the point that such reclaiming is only economically justified where there is a water shortage.

Dr. Pearlman, Dept. of Chemistry, Univ. of California, Berkeley, presented a paper on "The Treatment of Water for the Industrial Application of Atomic Energy," in which he described the problems presented in preparing water for use in the plutonium plants at Hanford, Wash. He pointed out that the mineral content of the large quantity of water used for cooling had to be carefully considered due to the effect of even minute quantities of certain elements, not infrequently found in normal water supplies, on the production of plutonium. It was also necessary to give very careful consideration as to the possible radioactivity of the water discharged from the plants.

O. G. Goldman, Asst. Supt., San Francisco Water Dept., described the method of "Detection of Water Leaks in Pipe Systems," by leak detectors similar to radio receivers. He pointed out that, in a city as hilly as San Francisco, leaks are often several hundred feet from the point of appearance of water, so that it has become general practice to take samples from the point of alleged leak for analysis by the Purification Div. Experi-

(*Continued on page 52*)

LUMETRON

Photoelectric Colorimeter Mod. 450 for Nessler Tubes

A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

- Turbidity tests in terms of APHA (ppm) scale.
- Color tests in terms of APHA (mg Pt) scale.
- Suited for determination of ammonia nitrogen, nitrate, nitrite, and for all other colorimetric tests according to APHA "Standard Methods."

Operates with all "low-form" Nessler tubes 32 mm O.D., 200 mm high. Requires no matched sets of tubes.

LUMETRON Mod. 450 eliminates the uncertainties of visual matching methods. It requires no permanent color standards and furnishes reproducible results independent of individual judgment and of light conditions.

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The Smith-Blair Repair Clamp is especially flexible . . . so much so that it easily adjusts itself to any pipe shape . . . being of "non-rigid" design it cannot distort or crush thin-walled or weakened pipe. On standard, riveted, O. D., cast iron or asbestos cement pipe it's the "snuggest-fitting" leak clamp yet!

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Other advantages you'll like—

1. **NO HINGES TO BREAK OR BIND**
2. **MAKES A PERMANENT REPAIR**
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Furnished in all sizes ½" through 24" O. D. Band widths to 30 inches in multiples of 3 inches. Specify if for LOW, MEDIUM, OR HIGH PRESSURE when ordering.

SMITH BLAIR
Water works supplies and specialties
INC.

SOUTH SAN FRANCISCO • CALIFORNIA

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

(*Continued from page 50*)

ence over a number of years has disclosed that about 40 per cent of the leaks are actually due to sewer pipe breaks.

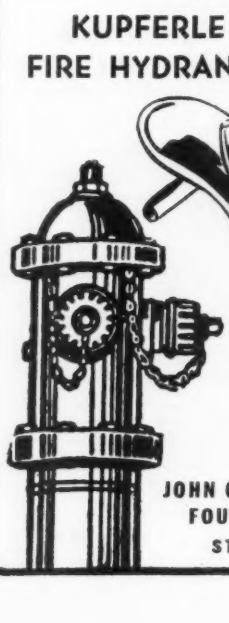
W. J. Ritzel, Supt., Pasadena Water Dept., and Dean M. Van Norman, Supt. of Equipment, Los Angeles Dept. of Water & Power, presented papers on the practical use and care of water works tools and other equipment. Ritzel's paper, which was presented by H. F. Jerauld in the absence of the author, emphasized the fact that good tools and good care are essential in maintaining service. Van Norman discussed some of the problems of the Los Angeles water system, which extends 350 miles, north and south, and covers some 500 square miles in area with all types of climatic conditions prevailing.

The technical sessions concluded with a round table discussion of current problems presided over by Lauren Grayson, Supt., Riverside Water Dept. After considerable discussion of Grumm's paper on utilities, a representative of the War Assets Corp. described requirement procedures in obtaining construction materials which were now available in fair amounts.

During the business meeting held at the Thursday evening dinner, various committes reported and the election of officers was announced. The

(*Continued on page 54*)

O. K.'d
By Fire Fighters
The Country Over
KUPFERLE
FIRE HYDRANTS



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FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

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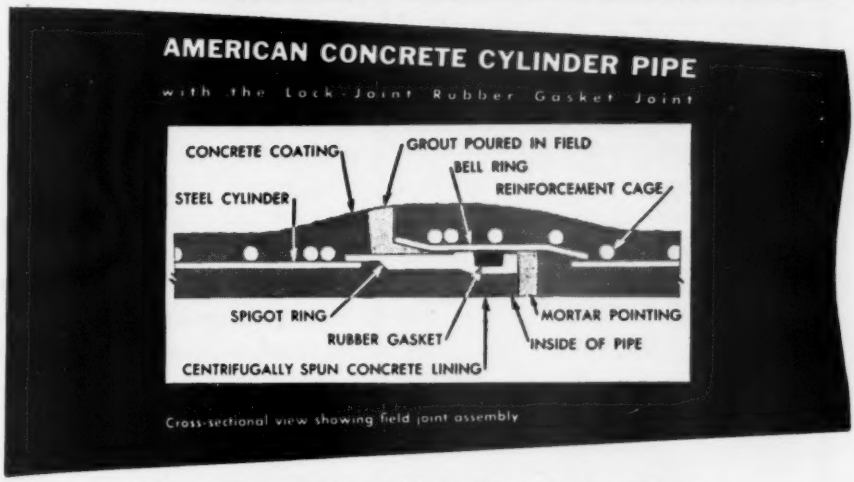
LONG-LASTING WATER SUPPLY LINES



Nearly 500,000 Feet in Use

High strength, durability and maximum carrying capacity! Ease and simplicity of installation! Low cost! These advantages of American Concrete Cylinder Pipe are being proven in installations throughout the West.

Sixteen years ago the company began development of this new type of pipe for small and medium diameter needs. Now available in diameters from 16″ upwards, it is a significant contribution to the water works engineering field. You can depend on it for permanence and maximum performance. Descriptive literature available on request.

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Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines.

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Main office and plant—4635 Firestone Blvd., South Gate, Calif. *District offices and plants*—Oakland, San Diego, Portland, Ore.

Specializing in the manufacture and installation of American Concrete Cylinder Pipe, Lock-Joint Concrete Cylinder Pipe, Pre-stressed Lock-Joint Concrete Cylinder Pipe, Hume Centrifugal Concrete Pressure Pipe.

(*Continued from page 52*)

Membership Com. reported a total of 680 section members as of October 24, 1946. Fred J. Klaus, Chairman of the Legislative Com., reported briefly that no bills had been introduced into the State Legislature and that the three federal bills dealing with stream pollution had been introduced but not passed in Congress. W. W. Aultman, Chairman of the Operators Certification Com., introduced a resolution to legalize and make mandatory the certification of Water Treatment Operators, with control to be vested in the State Dept. of Public Health. This resolution was adopted unanimously.

A second resolution adopted asked that a committee be authorized and instructed to urge the State of California to institute at once an analysis of the ground water pollution problem, and to promulgate a vigorous, coordinated program of solving it, thereby conserving and protecting the water supply in the interest of all concerned. Copies of this resolution were to be sent to the Governor, the State Dept. of Public Health, the State Water Resources Board, the State Fish and Game Com., the Senate and Assembly Com. on Water Supply Matters, state senators and assemblymen and all county departments and districts concerned with water supply and sanitation.

A final resolution regarding the State Highway Com. and utility relocation was also passed unanimously. This resolution read as follows:

"*Be it resolved* that a Legislative Committee be appointed with power to present necessary legislation, permitting the State Highway Commission to defray costs of relocating water facilities both private and public from funds of the project where necessary in the construction of all major freeways."

R. F. Goudey then gave a brief resume of George Warren Fuller's life, after which he read the recommendation of the Fuller Award Committee that C. G. Gillespie, Chief, Bureau of San. Eng., State Dept. of Public Health, be presented the award. It was adopted unanimously.

At the business meeting, the Golf Committee presented the awards to the winners among the 48 participants in the golf tournament. After the awards A.W.W.A. President Wendell R. LaDue delivered an address on the subject "Public Relations," bringing out the fact that the water works profession handles the greatest industry of any in the country, representing a 5½-billion dollar investment with over 80,000 employees, and yet sells its product at five cents a ton.

The convention closed with its traditional dinner-dance on Friday night, October 25, 1946, when those present were guests of the Water and Sewage Works Manufacturers Assn.

R. L. DERBY
Secretary-Treasurer

(*Continued on page 58*)

IS THE COST THAT COUNTS

By efficient life, we mean this:

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

A long life, and an efficient one, has earned for cast iron pipe the right to be known as Public Tax Saver Number One. Saving money day-by-day in maintenance cost. Saving money from generation to generation by avoided replacements that would be necessary were shorter-lived pipe used.

PUBLIC WATER SUPPLY —the Forgotten Industry

The public takes piped running water for granted —until it's turned off. A good public water supply is never news—except on the rare occasion when something goes wrong. To help create public awareness of the service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* influential readers of "Time" and "Nation's Business." For example, the following illustration and excerpts from a current advertisement:

What's cheaper than dirt?

Pure running water from a public water supply system is literally cheaper than dirt. A ton of it (240 gallons) costs as low as 10 cents. A ton of earth, dumped in front of your home, would cost many times 10 cents for trucking alone. This low cost of pure water is the more remarkable when you consider it includes collection, purification *and delivery right to your faucet.*

Water supply service is generally "out of sight and out of mind" of the public, and, too often, taken for granted. But it is America's largest industry, operated with great efficiency, 24 hours a day, 365 days a year.

Among the reasons for the low cost of water are, of course, the long life and low annual maintenance cost of cast iron pipe.

• • •

Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

SERVES FOR CENTURIES

(*Continued from page 54*)

VIRGINIA SECTION MEETING

The Virginia Section held its annual conference in Richmond on November 14–15, 1946. The registration of 221 was higher than any previous meeting, exceeding 200 for the first time.

The first morning of the meeting was devoted to registration and an inspection trip to the Richmond City Water Filtration Plant and Meter Shop. As in the past two years, the program was streamlined, there being only three papers each for the morning and afternoon sessions. Discussion of papers was enlivened by the discussion leader, who was selected by the Section Chairman before each session.

"Public Works Advance Planning Program of the Bureau of Community Facilities of the Federal Works Agency" was the subject of a talk by R. S. Hummel, Dist. Engr. of the Federal Works Agency, Richmond. The George Act as it relates to the advance planning program was explained, also instructions for making application for funds for planning was outlined. Answering a number of questions directed by those who were contemplating making application for funds, Hummel revealed that a large portion of the projects already approved were for improvements and additions to water supplies.

Marsden C. Smith, Chief Engr., Richmond Dept. of Public Utilities, read a paper entitled "Experience With Standards for Water Services," (*see* Jour. A.W.W.A., **39**: 23 (1947).

"Sulfur Dioxide in Water Treatment" was the subject of a paper by C. F. Bingham, Mgr. of Industrial Sales, Virginia Smelting Co., West Norfolk. He pointed out the uses of sulfur dioxide in treating water for control of taste and odors and listed a number of plants using the gas as a de-chlorinating agent. Bingham also mentioned the use of the chemical for cleaning filter sand and described the experiments carried on in rock wells in which case-yield from the wells was increased materially after treatment with sulfur dioxide.

"Drinking Water and Sanitaton for the American Forces in the Calcutta Area" was the subject of a paper by D. C. Teal, San. Engr., Chesapeake and Ohio Railway Co., Richmond. He gave a description of the water supply serving Calcutta and mentioned the problems confronting the American Army when it first arrived in that theatre of war.

A.W.W.A. President Wendell R. LaDue spoke on "Water Self-Analysis." This enlightening talk was well received and all felt that his words would assist them to be better prepared for their job.

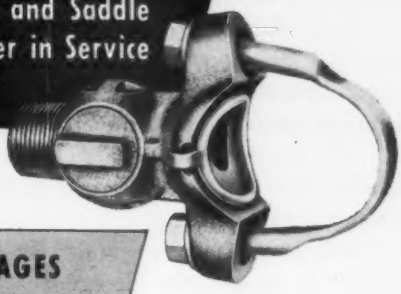
George W. Dean, State Forester, Virginia Conservation Com., Charlottesville, presented a paper "Watersheds and Forestation," in which he illustrated what could be accomplished by controlling watersheds and planning forestation. He pointed out that, aside from increasing the yield, the revenue from the sale of timber, poles and pulp wood is substantial.

(*Continued from page 60*)

It's New . . .

HAYS "DUO-STOP"

A Combination Corporation Stop and Saddle
That's Simpler to Apply, Stronger in Service



NINE IMPORTANT ADVANTAGES of the New HAYS "DUO-STOP" and Pipe Saddle

- The new Hays "Duo-Stop" makes possible a quick, simple, and safe installation of corporation stops on small mains of 2" size, where the small diameter and the thin wall make it impractical to tap the main.
- The "Duo-Stop" is strapped securely and permanently to the main, the stop is opened, and the hole is drilled, by a drilling machine inserting the drill through the stop.
- The installation may be made while the main is under water pressure - - Thus no shutdown of service.
- There is no threaded connection in the Pipe Saddle Shut-Off; stop and service clamp are one piece, solid rust-proof bronze, pressure tight and leakless.
- The extra strength, secured by one-piece construction and reinforced ribbed design, prevents distortion due to strain of strapping, or of outside stresses, and assures perfect functioning.
- The lead gasket provides a tolerance that guarantees a tight fit on either cast iron or steel service mains.
- The 2" "Duo-Stop" Saddle is designed for use on either 2" cast iron or steel pipe.
- The fact that service clamp and stop are cast in one piece simplifies purchasing and stock-keeping. Eliminates necessity of purchasing as separate items.
- Outlets for all types of services.

Write for Folder 105

HAYS
COPPER BRASS LEAD IRON
WATER WORKS PRODUCTS
HAYS MANUFACTURING CO., ERIE, PA.

(*Continued from page 58*)

A discussion of "Safe Practice in Water Distribution" was presented by A. T. Lundberg, Director, Dept. of Public Service, Arlington County. Lundberg reviewed the A.W.W.A. "Tentative Manual of Safe Practice in Water Distribution," devoting partcular attention to the section which included sanitary hazards, chlorine residuals, distribution system design, water main construction and service connection.

R. C. Bardwell, Supt. of Water Supply, Chesapeake and Ohio Railway Co., spoke on "Water Softening," describing the several methods and types of plants used by the railroad and noting the improvements made for applying chemicals and removal of sludge.

The technical sessions were enlivened by an unusual amount of discussion from the floor as well as by the large attendance that remained through each session.

Robert Warner Fitzgerald, Supt., Div. of Water Supply, Norfolk, was selected to receive the George Warren Fuller Award, with the following citation:

"In recognition of his outstanding service in maintaining and improving the water supply for the Norfolk Base Area during the critical war period, and for his research work and application in removing objectionable color and tastes from swamp water."

W. H. SHEWBRIDGE
Secretary-Treasurer

Burns & McDonnell Engineering Co., Kansas City, Mo., in its 49th year of consulting engineering work, has enlarged firm membership by the election to partnership of four former senior associate engineers. Joining the original group of R. E. McDonnell, C. A. Smith, R. L. Baldwin and R. H. McDonnell are: Arthur F. Hartung, Elec. Engr., who has been with the firm 18 years, specializing in electrical and power design; Russell G. Kincaid, Civ. & Hydr. Engr., with the firm 20 years, specializing in hydraulic work; C. Kelsey Mathews, Civ. Engr., with the firm 24 years, specializing in appraisals and sanitary works; and Earl J. Thomson, Elec. Engr., with the firm 11 years, specializing in water and sewage works and power plants.

As of January 1, 1947, the firm also announced the adoption of a new policy of profit sharing with its 75 employees on a basis of salary and seniority, believed to be the first instance of division of profits between management and employees in a professional engineering concern. The company, which has rendered engineering services on more than two thousand projects, involving construction costs of more than 600 million dollars, throughout the U.S., Mexico and Canada, expects to celebrate its golden anniversary in a new modern air-conditioned building to be erected in Kansas City, Mo.

NEWS OF THE FIELD

The Public Relations Studies which have to date been mailed to A.W.W.A. members have brought many evidences of favorable reception by utility executives. It has also been cheering to receive letters from equipment and materials manufacturers recording their complete support of the Association's efforts in urging members to tell their story to the public more effectively.

One large publicly owned utility has, for the first time in its history, engaged a man specifically for the purpose of developing and executing its own program of building public support for its well managed activities. Many others are known to have initiated one or more of the good will measures listed in the recently mailed "check list."

Although a public relations project can be expected to produce results that are largely intangible, the water works field, by its prompt and enthusiastic response, has shown a gratifying appreciation of the importance of the program. The A.W.W.A. officers are proud to have started the ball rolling.

Aluminum, since the pioneer work of Hall and his associates, has managed to capture the imaginations of men in all types of industry, stimulating them to research into its possible uses as a substitute for such older and better known metals as iron and copper. Thus, from time to time, water works executives have sought to employ aluminum sheets or tubing in one spot or another in the production or distribution of drinking water. It is not surprising then to note that, since aluminum pipe became available in standard dimensions, various attempts have been made to use it in water service lines.

In accordance with its policy to publicize both the advantages and limitations of all such new materials, the A.W.W.A. staff has attempted to keep itself informed of the results of both experiments and experience with them. Thus, it now feels obliged to point out that, although the aluminum industry has been aware of the possible market for its products in the water works field, its researches have not yet brought convincing evidence that the metal can be indiscriminately used to store or to convey natural or treated waters.

In view of this fact, it appears prudent to suggest that any water department considering the use of aluminum in any form to store or to convey water should take steps to ascertain whether the metal will resist the

(Continued on page 2)

(*Continued from page 1*)

corrosive attack of the particular supply involved. Through research, either by the water utility staff or by a testing laboratory, or through precise information derived from the producer of aluminum, it should be definitely determined whether the metal, in the form and type in which it is proposed to be used, will give a service life equal to or greater than that of other available materials. If on this basis the aluminum proves to be better suited for the work, its choice will be soundly indicated. If the studies disclose unsatisfactory performance, it will again have been demonstrated that "research before is better than repentance later."

The dollar volume of water works contracts in 1946 was 36 per cent higher than during the average peacetime year, according to the figures released by *Engineering News-Record*. The total of $109,159,000 was exceeded only in 1938 and 1939, before the war, and in 1942 during the war. Thus, at the end of the year, the backlog of proposed water works projects had reached a total of $1,131,173,000, sufficient to provide 11 years of water works construction at the 1946 volume, even if no future contracts were awarded except from the reserve.

Information of value to the entire chlorine industry will be derived from the extensive German (Chlor-Fako) chlorine reports, if the current move to translate them into English and make them available to the public is successful. The complete reports from 1932 to 1943 (1,884 pages) are now in the hands of the Office of Technical Services, which has made them available on microfilm in the German language. The documents describe thoroughly the experience of the German chlorine industry, its production troubles, by-products, control apparatus, research and development.

That New York City's water consumers have been "spoiled" became evident last January when a slight chlorine taste resulting from algae troubles at Croton Reservoir caused a barrage of complaints, particularly from consumers who lived near the chlorine application point. The Department of Water Supply, Gas & Electricity explained that it was endeavoring to reduce the amount of chlorination to the least possible extent to minimize the complaints. A department spokesman said: "The amount of free chlorine is unusually small, not exceeding one-tenth of a pound to a million gallons of water [approximately 0.01 ppm.]. . . . Recently there has been an infestation of certain microscopic vegetable organisms in the Croton Reservoir which, although harmless, gives a disagreeable taste which is accentuated by the presence of a small amount of chlorine in the water. The water is being treated at the Croton Lake to destroy these organisms and the situation is under control."

(*Continued on page 4*)

The Accelator

THE MODERN WATER TREATING PLANT

The widespread acceptance of the ACCELATOR principle of water treatment is due primarily to two basic reasons: First, the exclusive design of the ACCELATOR combines in one compact unit the separate steps of quick mixing, coagulating, settling and sludge removal. It saves up to 80% in space as compared to the older methods. Second, it is a sound, proven principle of water treatment that is being demonstrated daily by hundreds of successful installations throughout the country.

ADVANTAGES
- Space Saving
- Lower Construction Costs
- Longer Filter Runs
- Automatic Sludge Removal

The modern, streamlined ACCELATOR water treating process applies the "Know How" gained by INFILCO Inc. engineers from more than half a century of intensive research and development. Ask for ACCELATOR Bulletin 1824. INFILCO Inc., 325 W. 25th Place, Chicago 16, Illinois.

CONSULT INFILCO — FIRST IN WATER AND SEWAGE TREATMENT

(*Continued from page 2*)

Arthur F. Wirtz, Secretary-Treasurer, Atlas Mineral Products Co. of Mertztown, Pa., died suddenly of a heart ailment on December 16, 1946. Forty-six years of age, he had been with the company since 1921 and had served as an officer since 1926.

The American Standards Association specifications for manhole frames and covers for subsurface structures, A.35.1–1941, have been reaffirmed by vote of the sponsors, the sectional committee and the board of examination, and the issue of reaffirmation is now before the Standards Council for approval. Copies of the specifications are available from the ASA office at 35¢ per copy.

The Georgia Dept. of Public Health recently issued a report on the current status of public water supplies and sewerage facilities in the state, recording progress made and indicating the nature of present and future problems. The report is written in non-technical language in the expectation that it will be read by public officials concerned with the management of these services. It is the Department's hope that the information will stimulate exploration of local situations, lead to the asking of constructive questions by the general public and help to answer present questions. Together with the report goes the Department's offer to supply any interested citizen with all desired information regarding public water supply and sewerage systems.

Jack J. Hinman Jr., Col., Corps of Engrs., and Mrs. Hinman are now installed at the New Grand Hotel, Yokohama, from which he carries out his assignments with the 8th Army Headquarters in Japan. In a recent report back to his water works friends, Hinman passed on the word that the Tokyo City water supply has officially been declared potable. Only the supplies of outlying areas not served by the municipal distribution system and those of buildings relying on additional water from private wells interconnected to the city supply now come under the individual inspection and approval program.

(*Continued on page 6*)

GENUINE COOK WELL STRAINERS
REG. U. S. PAT. OFF.

A. D. COOK, INC.
Lawrenceburg • Indiana
Manufacturers of
Vertical Turbine Pumps, 10 to 10,000 gpm.
Well Strainers, 2 to 40 in.
Water Systems; Shallow Well, Deep Well and Ejector
Write for Sales Literature

DEEP WELL COOK PUMPS
REG. U. S. PAT. OFF.

WITH A. P. Smith tapping equipment you can make branch connections up to 42″ D under full pressure on any type or size of pipe, without interrupting the flow, draining the line, or riling the water. These machines are for use with SMITH tapping sleeves, hat flanges and tapping valves. The entire operation is quick, simple, satisfactory.

Write to The A. P. Smith Manufacturing Company for further information.

FIRE HYDRANTS
GATE VALVES
CHECK VALVES
INSERTING VALVES
TAPPING SLEEVES AND VALVES
WATER SERVICE BRASS GOODS

THE A. P. SMITH MFG. CO.

EAST ORANGE, NEW JERSEY

FLOOR STANDS
INDICATOR POSTS
TAPPING MACHINES
INSERTING MACHINES
PIPE CUTTING MACHINES
CORPORATION TAPPING MACHINES

(*Continued from page 4*)

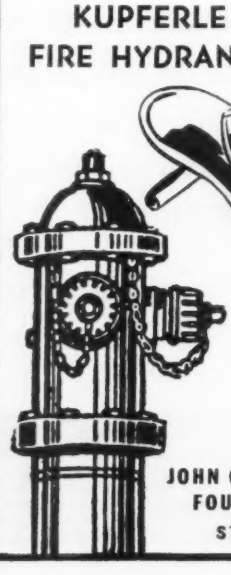
The Sanitation Research Project of the Association of American Railroads, organized in the spring of 1946 to study and make improvements in railway sanitation, has announced the appointment of Dr. Frederick G. Whelan as Elec. Engr. and Ralph F. Vaccaro as Bacteriologist. Former A.W.W.A. President Abel Wolman is Consultant Director of the project which will make its primary objective the development of a sanitary means of handling and disposing of sewage wastes from passenger cars.

Whelan was formerly employed as an Elec. Engr. by the General Electric Co. and was Research Asst. and Instructor in Elec. Eng. at Johns Hopkins Univ. Vaccaro, who completed 2½ years of service with the Army Medical Dept. in February 1946, has served as Sr. San. Eng. Aide at the Massachusetts Dept. of Public Health since that time.

Joe E. Jenkins, formerly assistant in the Panhandle and Houston areas, has been appointed Dist. San. Engr. of the Bureau of San. Eng., Texas State Health Dept. A civil engineering graduate of the Univ. of Texas, Jenkins recently completed a period of service with the Navy Seabees which took him to Trinidad, Hawaii and the Philippines.

(*Continued on page 8*)

O. K.'d
By Fire Fighters The Country Over
KUPFERLE FIRE HYDRANTS



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A BIG STEP FORWARD
in Bell & Spigot Main Jointing
The
HYDE-RO RING

- Quicker sterilization
- Saves repeated hypochlorite flushings
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- Speeds repairs by giving dry joints
- Works with *Tegul*-MINERALEAD, lead or Portland Cement. Serves on beaded end or straight end pipe
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THE ATLAS MINERAL PRODUCTS COMPANY of Penna. . . . Mertztown, Pennsylvania

Manufacturers of Tegul-MINERALEAD ingot form jointing compound for B. & S. Pipe. Also G. K. SEWER JOINT COMPOUND

BRINGING the benefits of soft, iron-free water to your community will provide a real boost in popularity for your administration. And here's why:

Women know about the benefits of soft water . . . how it *saves soap and protects fabrics* from harsh soap curds — how it makes *dishes sparkle* — and how wonderful it is for *bathing and shampooing*. What's more, soft water saves money by cutting water supply maintenance expense, reducing plumbing repairs, and lowering fuel consumption costs.

Refinite equipment for water conditioning is *not expensive*. And it pays for itself by adding subscribers and by reducing maintenance costs.

Get all the details about soft water. Write today — there is no obligation.

●

Everything For the Swimming Pool

Remember—Refinite supplies equipment for swimming pools, as well as laboratory analysis and swimming pool control services. Ask for details.

The Refinite Corporation
Refinite Building Omaha, Nebraska

(*Continued from page 6*)

Louis R. Caplan has returned to his position as Washington Repr. of Hagan Corp., Hall Labs. & Calgon, Inc., after two years service as a Capt. in the Army San. Corps. Placed in charge of medical inspection at Indiantown Gap Military Reservation when he entered active duty, he later served in Italy, first as a sanitary engineer and later as malariologist.

Prior to his enlistment, Caplan was Sales Engr. with the Ash Engineering Co. of Philadelphia, Hagan representatives, for seven years, covering industrial plants in the Baltimore, Virginia and Washington areas. He previously served as Asst. Engr. with the Maryland State Health Dept. for a year and a half following his graduation from The Johns Hopkins Univ.

Worthington Pump and Machinery Corp., Harrison, N.J., has since January 2 been quoting firm prices on all its products except those major purchased components such as motors and other electrical equipment and steam condenser tubes on which it can offer only the protection given to the company by its suppliers. Only two subsidiaries, which are especially dependent upon copper and steel plate, have been excluded from the firm price policy and it is expected soon to be able to establish their sales too under that basis.

(*Continued on page 10*)

LUMETRON

Photoelectric Colorimeter Mod. 450 for Nessler Tubes

A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

- Turbidity tests in terms of APHA (ppm) scale.
- Color tests in terms of APHA (mg Pt) scale.
- Suited for determination of ammonia nitrogen, nitrate, nitrite, and for all other colorimetric tests according to APHA "Standard Methods."

Operates with all "low-form" Nessler tubes 32 mm O.D., 200 mm high. Requires no matched sets of tubes.

LUMETRON Mod. 450 eliminates the uncertainties of visual matching methods. It requires no permanent color standards and furnishes reproducible results independent of individual judgment and of light conditions.

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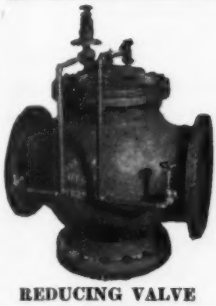
ALTITUDE VALVE

Controls elevation of water in tanks, basins and reservoirs

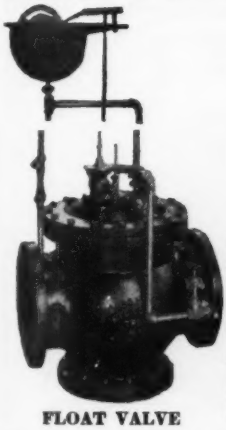
1. Single Acting
2. Double Acting



REDUCING VALVE

Maintains desired discharge pressure regardless of change in rate of flow

Regulates pressure in gravity and pump systems; between reservoirs and zones of different pressures, etc.



FLOAT VALVE

Maintains levels in tank, reservoir or basin

1. As direct acting
2. Pilot operated and with float traveling between two stops, for upper and lower limit of water elevation.

Maintains safe operating pressures for conduits, distribution and pump discharge

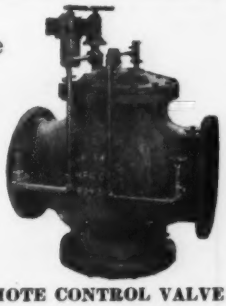
SURGE-RELIEF VALVE

A self contained unit with three or more automatic controls

COMBINATION VALVE

Combination automatic control both directions through the valve.

Electric remote control—solenoid or motor can be furnished



REMOTE CONTROL VALVE

Adapted for use as primary or secondary control on any of the hydraulically controlled or operated valves.

Packing Replacements for all Ross Valves Through Top of Valve

ROSS VALVE MFG. CO., INC., P. O. BOX 593, TROY, N. Y.

(*Continued from page 8*)

L. R. Cochrane, Manager of the Baldwin Park County, Calif., Water District, died on November 18, 1946, at the age of 69. At the time of his death, Cochrane had completed the twentieth year of his supervision of the organization, having served as manager continuously from the time when the district was organized mainly through his efforts.

Kenneth F. Knowlton recently resumed his post as Supt.-Chemist, Salem, Mass., Water Supply Board upon his release from the San. Corps. During his Army service, Knowlton served primarily as an Asst. Medical Inspector, but spent his last six months of duty as San. Officer aboard the hospital ship "Charles A. Stafford."

Egmont S. Smith, Dallas, Tex., representative of the Neptune Meter Co., was honored recently by the A.W.W.A. Southwest Section for his 36 years of "unselfish service in the interest of water works men of the Southwest," when he resigned from his post as Chairman of the section's Publication Committee "in the interest of younger men in the ranks."

At the business meeting following his resignation last October, the section Board of Trustees unanimously adopted a resolution citing him for his outstanding leadership which spanned the years from the organization of the Southwestern Water Works Assn. in 1912 through its development and final incorporation with the A.W.W.A. The resolution, which was read into the minutes of the section, also reviewed his contributions as a member of the Board of Governors of the *Southwest Water Works Journal* for 23 years, as first representative on the parent organization's Board of Directors, and as a tireless worker on local and national committees over the years.

(*Continued on page 12*)

ZECO GREENSAND ZEOLITE

ZECO and HI–ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.

90 WEST STREET **NEW YORK 6, N. Y.**

New! ELECTRICALLY OPERATED RECEIVER

TOTALIZES • INDICATES • RECORDS FLOW

Over any distance

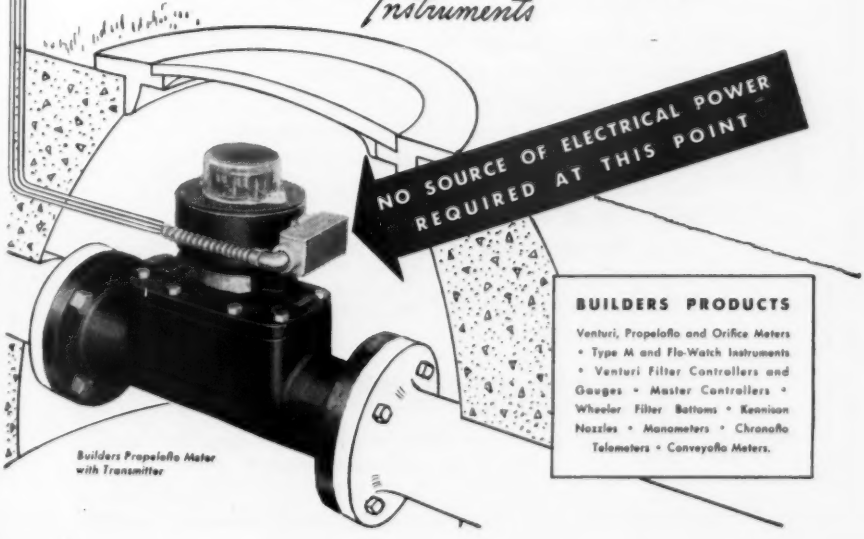
Builders Totalizer, Indicator, Recorder

INSTALLS ON PROPELOFLO OR ANY MECHANICAL METER

Builders new electrically operated transmitter and receiver greatly broaden the applications of any mechanical flow meter. No longer is it necessary to go into manholes and inaccessible locations to read a meter. Complete chart records and rate of flow as well as exact total of flow can now be had at any point, however remote. The recording chart has uniform graduations throughout its range — a special Builders feature. Alternating current is used at the receiver; no power required at the meter.

Builders Propeloflo meter is well adopted to remote operation . . . ***only two wires are needed*** to transmit complete flow information to the main building. The new transmitter greatly broadens the usefulness of the Propeloflo, already extensively used as a main line meter. The streamline Venturi design of this Propeloflo meter creates uniform velocity distribution where the flow meets the propeller, giving exceptional accuracy over a wide range with low head loss. For Bulletin C11-380.21, address Builders-Providence, Inc., (Division of Builders Iron Foundry), 25 Codding St., Providence 1, R. I.

BUILDERS PROVIDENCE *Instruments*



Builders Propeloflo Meter with Transmitter

BUILDERS PRODUCTS

Venturi, Propeloflo and Orifice Meters • Type M and Flo-Watch Instruments • Venturi Filter Controllers and Gauges • Master Controllers • Wheeler Filter Bottoms • Kennison Nozzles • Manometers • Chronoflo Telemeters • Conveyoflo Meters.

(*Continued from page 10*)

Elevated water tanks have quite generally come to serve as the welcome mats of the communities they serve. No longer are we surprised to find a town's vital statistics in letters three feet high girdling some thousands of gallons of drinking water. But down Georgia way, where glasses are more often used for mint juleps, one is still rather startled to see the following inscription on the Emory University water tank:

EMORY COLLEGE 1850
IT WAS FOUNDED AND ORGANIZED BY
OUR BELOVED
PRESIDENT, JOHN BILLINGS
BORN 1815
DIED 1870
CAPACITY 150,000 GALLONS

Herbert Scott-Smith, Supt. of Public Works, Waterbury, Conn., in charge of streets, sewers and water supply, retired on January 1 after 39 years of service with the department. Upon his departure, the water supply division was placed under separate supervision.

(*Continued on page 14*)

CYANAMID

Sulphate of Alumina

CYANAMID through the control of its basic raw materials can assure you of a uniform high quality product at all times.

It assists in the removal of taste and odor.

It is and remains free flowing.

It is less corrosive than other coagulants.

It does NOT clog the dry feed machine.

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Your inquiry is invited on CYANAMID quality Sulphate of Alumina.

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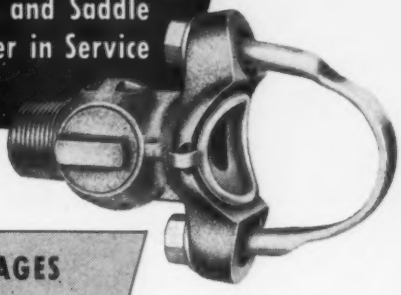
It's New . . .

HAYS "DUO-STOP"

A Combination Corporation Stop and Saddle
That's Simpler to Apply, Stronger in Service



NINE IMPORTANT ADVANTAGES of the New HAYS "DUO-STOP" and Pipe Saddle

- The new Hays "Duo-Stop" makes possible a quick, simple, and safe installation of corporation stops on small mains of 2" size, where the small diameter and the thin wall make it impractical to tap the main.
- The "Duo-Stop" is strapped securely and permanently to the main, the stop is opened, and the hole is drilled, by a drilling machine inserting the drill through the stop.
- The installation may be made while the main is under water pressure - - Thus no shutdown of service.
- There is no threaded connection in the Pipe Saddle Shut-Off; stop and service clamp are one piece, solid rust-proof bronze, pressure tight and leakless.
- The extra strength, secured by one-piece construction and reinforced ribbed design, prevents distortion due to strain of strapping, or of outside stresses, and assures perfect functioning.
- The lead gasket provides a tolerance that guarantees a tight fit on either cast iron or steel service mains.
- The 2" "Duo-Stop" Saddle is designed for use on either 2" cast iron or steel pipe.
- The fact that service clamp and stop are cast in one piece simplifies purchasing and stock-keeping. Eliminates necessity of purchasing as separate items.
- Outlets for all types of services.

Write for Folder 105

HAYS
COPPER · BRASS · LEAD · IRON
WATER WORKS PRODUCTS
HAYS MANUFACTURING CO., ERIE, PA.

(*Continued from page 12*)

Korean water works activities under the Army Dept. of Public Works at Seoul were recently outlined to the A.W.W.A. in a letter from S. J. Shank, civilian employee of the department. Pointing out the differences in problems encountered, Shank reported:

During the past forty years, the Japanese have occupied and controlled all important positions in this field; consequently, the Koreans have had little training or experience in water works operations. During the process of repatriating the Japanese, all records, maps, blueprints and important documents were either removed or destroyed. The loss of these records has been a serious handicap. Some installations, at the time of our occupation, were only 50 per cent completed. To complete these projects with unskilled personnel and hampered by shortages of all types of material and a lack of proper supervisors, is one of the many serious problems confronting us today.

Due to the unusually high tide on the west coast, which reaches a maximum of 34 ft., it was necessary to construct water supply plants some 20 miles upstream on the Han Gang River to avoid brackish water. At present we have four semi-modern filtration plants serving the Seoul-Inchon area with over 2 million population. With the addition of Army personnel, civilians and dependents, it has placed an overload on our present distribution system; consequently, it has been necessary to ration water certain hours of the day. The shortage of water has been seriously felt in fighting fires.

This office is desirous of placing in operation six concrete reservoirs, which the Japanese constructed in 1944 but failed to connect to the distribution system. Lack of material at present is hampering this project.

The establishment of a Korean Water Works Association, with the purpose of promoting interest in improvements and the development of standard methods, is the objective of the Military Government Bureau of City Planning for 1947.

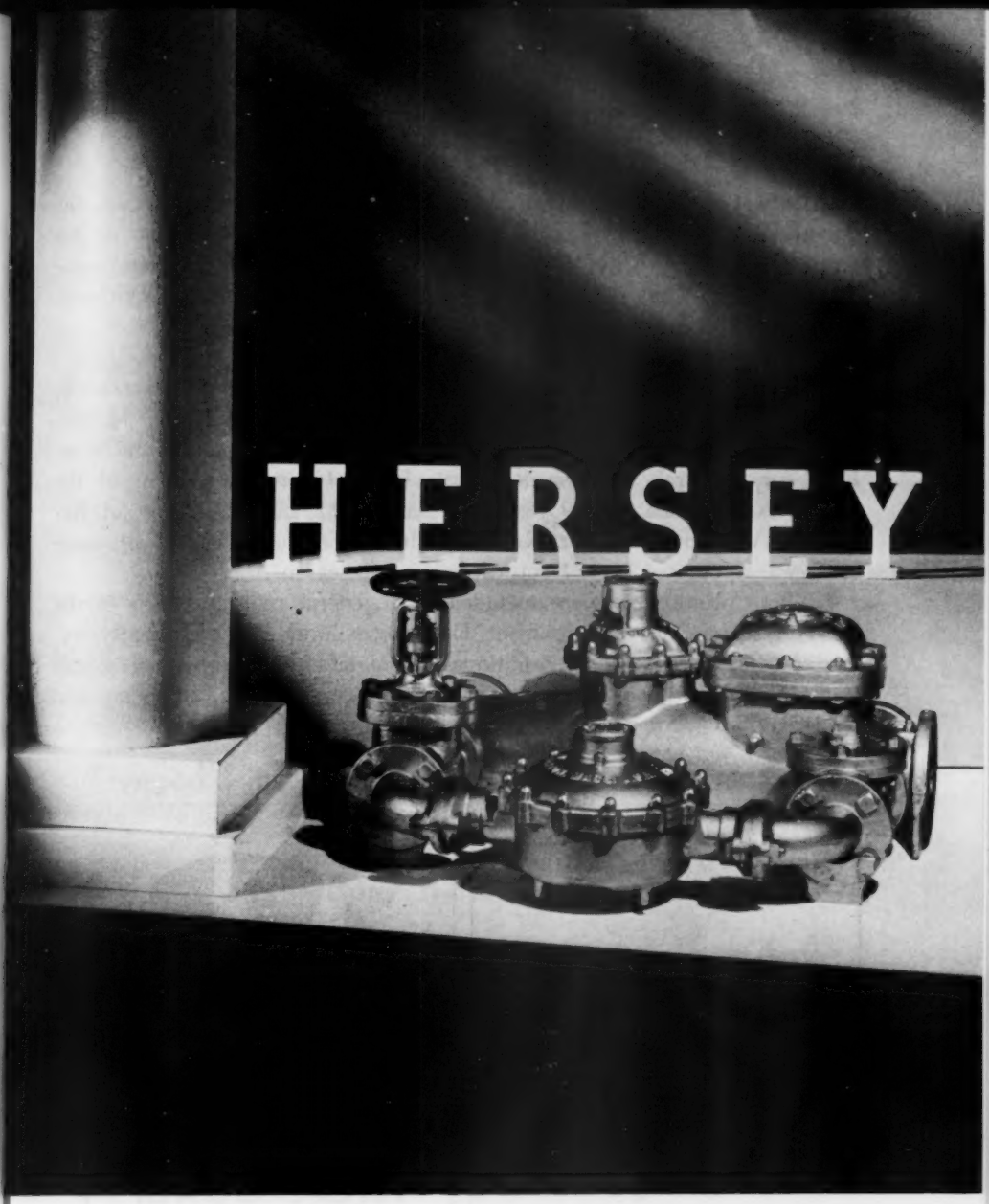
F. M. Travis, Chairman of the Board, Torrington, Conn., Water Co., died November 24, 1946, at the age of 79.

Travis, who was largely responsible for the development of both the Torrington Water Co. and the Torrington Electric Light Co., devoted most of his business career to public utility enterprises. In addition to his position with the water utility, he was also President of the Torrington Electric Light Co. and Chairman of the Board of the Bridgeport, Conn., Gas Light Co. at the time of his death.

Travis's early engineering training was received through association with the late Charles H. Nettleton of Derby, Conn., in the construction of gas works at Derby, Torrington, Winsted and New Haven. He later worked on the construction and rebuilding of gas plants at Bristol, New Britain, Bridgeport and Danbury and on the water, telephone and electric systems at Carlsbad, N.M.

Travis became an Active Member of the Association in July 1917.

(*Continued on page 16*)



HERSEY DETECTOR METERS

are simple in construction, yet built with the precision of a fine instrument. They are designed for use on fire or combined fire and manufacturing services where it is required to measure accurately domestic flows and also full flows for extinguishing fires and without interference to the full capacity of the supply pipe.

Listed as standard by Underwriters' Laboratories, Inc.

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(*Continued from page 14*)

Robert S. Tait, who has devoted the past 46 years to service in the water supply field, recently retired from his position as Supt. of the Santa Cruz, Calif., City Water Works. John C. Luthin, Oakland consulting engineer, has taken over supervision of the plant, while Tait continues his work in the position of Asst. Supt.

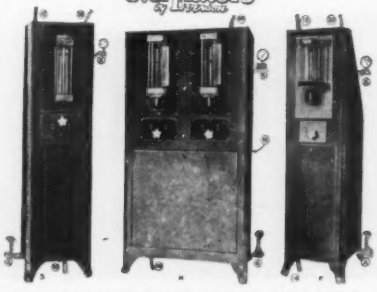
Portland Cement Assn., Chicago, promoted three of its scientific research staff members to new positions effective January 1. F. R. McMillan, Director of Research since 1927, was designated Asst. to the Vice-Pres. for Research and Development. H. F. Gonnerman, Mgr. of the PCA Research Lab. for 19 years, replaced McMillan as Director of Research. William Lerch, Sr. Research Chemist in the Chicago Lab. since 1940, was appointed Mgr. Dept. of Applied Research.

These promotions were included in a general reorganization of the PCA Research and Development Div., necessitated by the greatly extended research program. Additional action taken has seen the research staff greatly augmented by a number of younger chemists, engineers and physicists.

(*Continued on page 18*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

SterElators by Everson



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

SterElators by Everson

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221 West Huron Street, Chicago 10, Illinois

M H

HIGH QUALITY VALVES HYDRANTS

M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

WF

Cast Iron Pipe

Manufactured in Sizes 2" to 96"—

Bell and Spigot Pipe

Special Castings

Flanged Pipe

Flexible Joint Pipe

Short Body B. & S. Specials

Warren Spun Centrifugally Cast Iron Pipe

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75 Federal St., Boston 10, Mass.

Works

Phillipsburg, N. J.
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(*Continued from page 16*)

Louis R. Howson, whose winning of the Goodell Prize for 1946 gives him a clean sweep of A.W.W.A. national and section awards, and who has served the Association as a Trustee, Director, Vice-President and President, as well as being chairman of committees too numerous to mention, was recently elected President of the Illinois Section of the American Society of Civil Engineers. Meanwhile the Society's Indiana Section named Lewis S. Finch, Chief Engr., Indianapolis Water Co., to a similar post in that state.

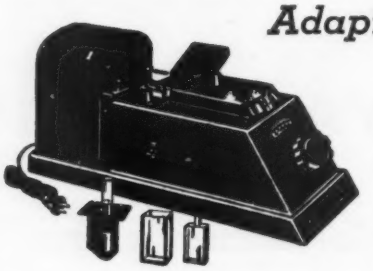
Thomas R. Camp, Boston Cons. Engr., has announced the formation of a partnership with his associates Herman G. Dresser and Jack E. McKee to continue a consulting practice under the firm name of Camp, Dresser & McKee. The firm will specialize in water and sewage works and the treatment and disposal of municipal and industrial wastes.

Dresser, who has been with the Camp office as principal engineer since 1944, has a background of more than 20 years of consulting engineering work. McKee joined Camp in 1946 upon his release from active duty with the Army Corps of Engrs. His previous experience in sanitary engineering was received in work with the U.S. Public Health Service.

(*Continued on page 20*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

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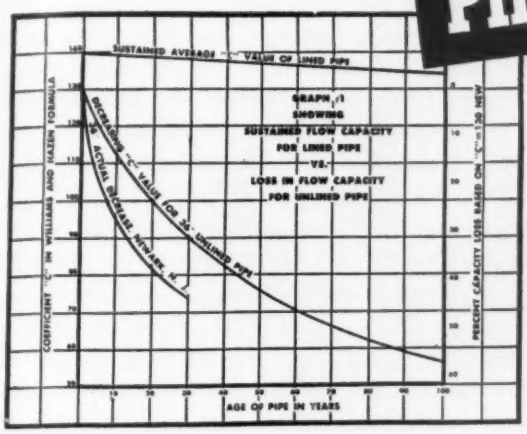
179 EAST 87th STREET · NEW YORK, N. Y.

PIPE LINING


SUSTAINED AVERAGE "C" VALUE OF LINED PIPE
GRAPH #1
SHOWING
SUSTAINED FLOW CAPACITY
FOR LINED PIPE
-VS-
LOSS IN FLOW CAPACITY
FOR UNLINED PIPE
DECREASING "C" VALUE FOR 24" UNLINED PIPE
ACTUAL DECREASE NOTABLE AT 7
COEFFICIENT "C" IN WILLIAMS AND HAZEN FORMULA
PERCENT CAPACITY LOSS BASED ON "C"=130 NEW
AGE OF PIPE IN YEARS

CONSERVE YOUR WATER MAIN INVESTMENT BY MAINTAINING MAXIMUM LONG TERM FLOW CAPACITY

The economic value of a water main is dependent on sustained maximum Revenue-Producing Flow Capacity

It is not enough to evaluate water main investments solely in terms of the long term external structural life. Have you ever seen the inside of your important supply mains? Most lines are in good structural condition after many years of service. But what of the loss in fire fighting and operating pressures, in increased pumping costs, in reduction of revenue-producing output — all due to decreased flow capacity caused by corrosion, tuberculation and incrustation?

The chart above shows a comparison of the sustained flow capacity in cement lined pipe and the losses in flow capacity of unlined pipe. The sober conclusion is unmistakable. Unlined pipe for water mains is technically unsound and financially disastrous.

If you have water mains over 30 inches in diameter, THE AUTOMATIC PRELOAD CEMENT LINING AND TROWELING MACHINE can restore the original flow capacity, (and possibly increase it beyond the original capacity in the case of old fully rivetted plate pipe lines).

Write for our new PIPE LINING Bulletin

THE **PRELOAD** CORPORATION

420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

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Toronto, Ont. Halifax, N. S.

PRELOAD

PIPE LINING ENGINEERS
Designers and Builders of Prestressed Concrete Structures, Prestressed Concrete Storage Tanks and Pressure Pipe

(*Continued from page 18*)

Ralph B. Wiley, Head, School of Civ. Eng., Purdue Univ., was one of the A.W.W.A. members elected to office at the recent A.S.C.E. New York Convention. Named to one of the two vice-presidencies, Wiley took office together with Directors Samuel A. Greeley, Cons. Engr., Chicago, and David L. Erickson, City Engr., Lincoln, Neb. At the same time, Lewis A. Schmidt Jr., Cons. Engr., Chattanooga, Tenn., was awarded the Society's James Laurie Prize for his paper, "Unusual Problems—Flowing Water in Underground Channels, Hales Bar Dam, Tennessee."

Also on the program, Don E. Bloodgood, Assoc. Prof. of San. Eng., Purdue Univ., pointed out that despite the failure of passage of any of the nearly 100 bills which have been introduced in Congress during the last 50 years, a federal law is needed to co-ordinate the activities of state stream pollution control units. Further emphasizing the need for pollution control, Ogden S. Jones, Chief Geologist, Oil Field Sec., Kansas State Board of Health Div. of Sanitation, pointed out that the encroachment of oil field brines upon water supply sources would necessitate rationing of water in the not-too-distant future unless satisfactory measures of disposal were developed and applied.

(*Continued on page 22*)

MONITOR COVERS

For large meter pits Ford MONITOR Covers are ideal. They are made for 24″, 30″ and 36″ tile, have a 20″ lid opening and are 7″ deep. Inner lid optional. All sizes have the Lifter Worm Lock. Catalog and further information on request.

FORD METER BOX CO.,
WABASH, IND.

Prevent Rusting

Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.

If your tanks and steel structures are not now protected by this proven low cost method, they should be. No obligation. Send for fully descriptive literature today.

RUSTA RESTOR
Division of
THE JOHNSTON & JENNINGS CO.
862 Addison Road, Cleveland 14, Ohio

Extra Hands···**to Aid Industry—and You!**

HANDLING COMPLEX PROBLEMS in the chemical process industries makes many a purchasing and production executive wish he had as many extra hands as this ancient Hindu idol to help him through—*and he has!*

THEY ARE HIS . . . and yours—in the cooperation and assistance of chemists, engineers, and technicians on General Chemical Company's Technical and Engineering Service staffs. These experts are well qualified by technical training and by practical industry-wide experience to offer sound, constructive advice in many ways—whether your problems deal with industrial, scientific or agricultural chemicals.

THEY CAN FURNISH pertinent data on properties, grades, and packaging of General Chemical products . . . advise on materials and methods for handling and storing them . . . consult on their applications to your operations . . . and work with you in the development of special chemicals to meet your individual requirements.

When "extra hands" such as these can help you, just phone or write to the nearest General Chemical Company Sales and Technical Service Office listed below.

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In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited
Montreal • Toronto • Vancouver

(*Continued from page 20*)

Arthur B. Morrill, U.S. Public Health Service San. Engr. on loan to the city of Detroit, has been busy roaming through China for the last two years selling the idea of public health through modern water and sewerage systems under the auspices of the cultural relations division of the U.S. State Dept. Just recently the New York *Times* devoted a column to one of his big "sales," a job he claimed was the easiest as well as the most adventurous mission he has carried out to date. The details as reported by the *Times* were as follows:

Last spring the American public health emissary concluded the satisfying task of getting Lanchow, ancient walled capital of Kansu Province, all lined up for a new piped water supply. He had heard much of the exotic attractions of the great Tibetan lamasery of Ta Erth Ssu, 200 miles west of Lanchow, and decided to visit the place.

En route, Col. Morrill stopped at near-by Sining. The City Health Commissioner, a modern-minded young man from the Shanghai area, came to see him and told him about a typhoid epidemic that had taken a heavy toll in Sining a short time before. The Health Commissioner mentioned the possibility of a piped water system for Sining.

(*Continued on page 24*)

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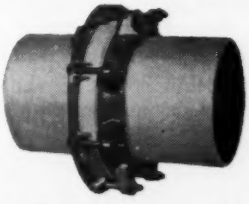

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ONE OF THE DRESSER INDUSTRIES

(*Continued from page 22*)

Col. Morrill became immediately enthusiastic and made some quick calculations as to costs. The two men then went to see Chinghai's swashbuckling, mustachioed Governor General, Ma Pu-fang, one of the few warlords of the old school remaining in China. A Moslem of the famous Ma family of Western Kansu, Ma Pu-fang rules Chinghai with a stern but sometimes enlightened despotism.

He accepts only nominal supervision from the Nanking Government.

The American engineer gave Ma his gospel of health through modern sanitary measures.

"He caught on immediately," Col. Morrill reports. "He never blinked an eyelash at my cost figure of $150,000 (U.S.) for work and machinery. In three nights and two days I had sold the new water system, worked out the designs, visited my near-by lamasery and was on my way back to Lanchow."

Sining has a population of 60,000, is 700 miles by road from Chengtu, Szechwan, nearest city with a piped water supply. And on the west across deserts and mountains in the heart of Asia, Col. Morrill calculated, you do not come across another piped water system until you hit Kabul, lofty and remote capital of Afghanistan, nearly 1,500 airline miles away.

Col. Morrill finds the present high cost of labor in China as a big inducement for cities to install water and sewage systems.

"Urban residents are finding that getting water through a pipe costs a fraction what it costs when brought in buckets by coolies from wells or a river," Col. Morrill says, "but we have to soft-pedal the clearness and purity angle because in some cities people have a prejudice against clear well water and prefer muddy river water. In Chungking coolies selling purified water by bucket from a water pipe had to put mud in it before the people would take it."

Harvey J. Kulin, formerly Indianapolis representative of Infilco, Inc., joined L. I. Couch in January to establish the new firm of Couch & Kulin, Cons. Engrs., with offices in the Mansur Bldg., Indianapolis.

Howard L. Williams, Superintendent of the Ludington, Mich., Water Works for 48 years and life member of the Association, died of a heart ailment on January 24, at the age of 82.

Following his education in the Ludington schools and a period of work in the hardware and lumber industries, Williams took over management of the Ludington private water utility in 1891. When the municipality purchased the plant in 1900, he remained as superintendent, continuing in that position until his retirement on January 1, 1939.

Throughout his life, Williams maintained a keen interest in the water works field, joining the Association in 1894 as an Active Member. His pioneering activities extended, too, to his community, of which he was one of the early settlers.

(*Continued on page 54*)

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Ayres, W. F., Mgr., Texas Water Co., 2225 Bennington St., Houston 10, Tex. (Jan. '47)

Babcock, Harold H., City Supt., Fort Morgan, Colo. (Jan. '47)

Baker, Ralph H., Jr., San. Engr., 192 Bartlett Rd., Winthrop 52, Mass. (Jan. '47)

Bastrom, A. E., Water Supt., Ketchikan Public Utilities, Ketchikan, Alaska (Jan. '47)

Batten, O. S., Civ. & Mining Engr., Pikeville, Ky. (Jan. '47)

Beeville Water Works & Sewer Dept., C. R. Brock, Supt., Beeville, Tex. (Corp. M. Jan. '47)

Benoit, Jacques E., Dist. Sales Mgr., Wallace & Tiernan, Ltd., 1502 St. Catherine, W., Montreal 25, Que., Can. (Jan. '47)

Benson, K. E., Cons. Engr., 213 Boyce-Greely Bldg., Sioux Falls, S.D. (Jan. '47)

Bickford, Paul N., Civ. Engr., Community Planning, Interior, (U.S.B.R.), Box 1281, Ephrata, Wash. (Affil. Jan. '47)

Blake, W. E., Sales Repr., Kennedy Valve Mfg. Co., Hollenden Hotel, Cleveland, Ohio (Jan. '47)

(*Continued on page 30*)

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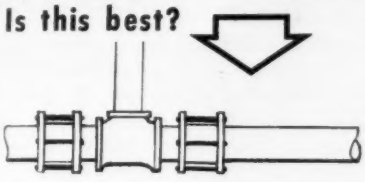

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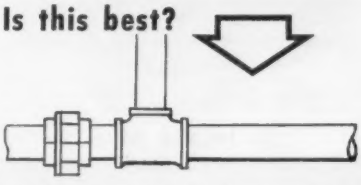

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(*Continued from page 28*)

Blasing, C. J., Supt., Water & Light Dept., Virginia, Minn. (Jan. '47)

Boyer, Bruce R., Asst. Water Comr., Water Dept., City Hall, Cloquet, Minn. (Jan. '47)

Boynton, Robert S., Gen. Mgr., National Lime Assn., 927—15th St., N.W., Washington, D.C. (Jan. '47)

Brazil, Charles, Mayor, Box 909, Colorado City, Tex. (Jan. '47)

Brill, John E., Plant Operator, Municipal Water Works, Moorefield, W.Va. (Affil. Jan. '47)

Brock, C. R., *see* Beeville Water Works & Sewer Dept.

Brush, Howard R., Jr., Jr. San. Engr., Div. of Water Purification, 6843 S. Oglesby Ave., Chicago 49, Ill. (Jan. '47)

Bumstead, John C., Asst. Editor, *Engineering News-Record,* 330 W. 42nd St., New York 18, N.Y. (Jan. '47)

Call, Jack, Purchasing Agent, California Water Service Co., 374 W. Santa Clara St., San Jose, Calif. (Jan. '47)

Campbell, Roderick William, Asst. Chemist, The Mahoning Valley Sanitary Dist., Box 298, Youngstown 1, Ohio (Jan. '47)

Canham, Chester H., San. Engr., State Board of Health, 100 N. 8th St., Terre Haute, Ind. (Jan. '47)

Capron, Edwin D., Repr., Neptune Meter Co., 2014 Commerce St., Dallas 1, Tex. (Jan. '47)

Carborundum Co., O. R. Stach, Sales Development Engr., Refractories Div., Perth Amboy, N.J. (Assoc. M. Jan. '47)

Carroll, J. P., Water Well Drilling Contractor, 206—1st St., W. Palm Beach, Fla. (Jan. '47)

Clark, F. E., City Engr. & Water Supt., 205½ Duryea St., Raymond, Wash. (Jan. '47)

Community Public Service Co., R. W. Hester, Asst. Water & Gas Supt., Ft. Worth Elec. Bldg., Fort Worth, Tex. (Corp. M. Jan. '47)

Cook, Leland B., Civ. Engr., 109½ S. Spring St., Tupelo, Miss. (Jan. '47)

Cooper, Harold U., Supt., Water & Light, Box 64, Waseca, Minn. (Jan. '47)

Crutchfield, B. W., Tech. Director, Company Rayonera Cubana, Apdo. 915, Havana, Cuba (Jan. '47)

(*Continued on page 32*)

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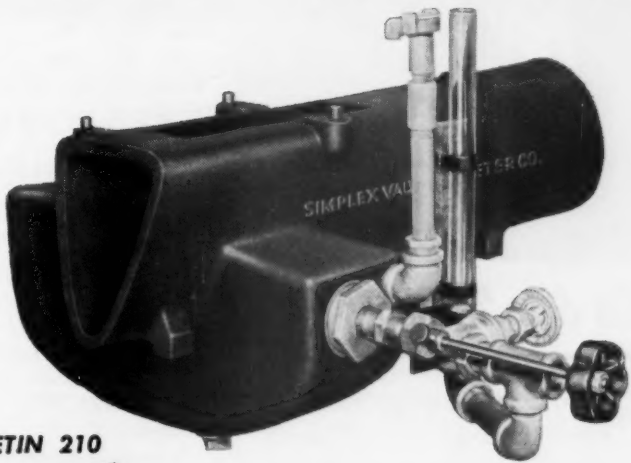

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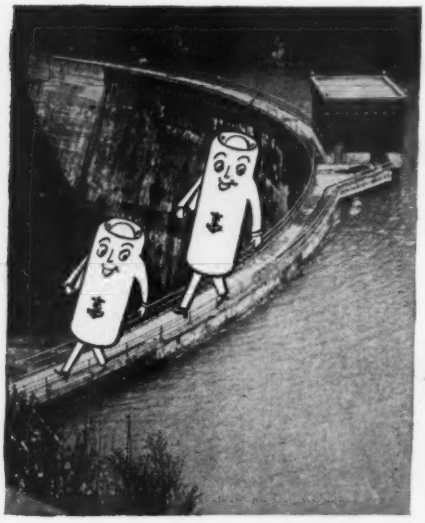

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Dibble, J. C., Drilling Contractor, 604 Patrick St., Kissimmee, Fla. (Jan. '47)

Echaide, Ladislao, Gen. Mgr., Industrias Espanolas S.A., San Sebastian, Spain (Jan. '47)

Ekstrom, C. G., *see* Arizona Edison Co.

Elder, Frank X., Civ. Engr., Dept. of Water Supply, Gas & Electricity, 1932 Arthur Ave., New York, N.Y. (Jan. '47)

Fall, Lloyd W., *see* Redford Township Water & Sewer Dept.

Fowler, H. A., *see* Vermillion Water Dept.

Fuller, A. E., Box 831, Miami 30, Fla. (Jan. '47)

German, William E., Supt., Water Dept., 331 Spring St., Palmyra, N.Y. (Jan. '47)

Godfrey, W. R., *see* Saint John Water & Sewerage Dept.

Gordon, Spiro G., Draftsman, Water Purification Div., 3300 E. Cheltenham Pl., Chicago 49, Ill. (Jan. '47)

Gould, Harold T., Supt., Water Dept., 110 W. Garvey Ave., Monterey Park, Calif. (Jan. '47)

Graham, C. W., Water Works Engr., Canadian Underwriters Assn., 44 Victoria St., Toronto, Ont., Can. (Jan. '47)

Gray, Don E., Assoc., G. D. Hall & Assoc., Larson Bldg., Yakima, Wash. (Jan. '47)

Hall, Louis, General Foreman, Water Works, Dewey & Felix Sts., Rochester 6, N.Y. (Jan. '47)

Hardman, Robert L., Engr., National Water Main Cleaning Co., 50 Church St., New York 7, N.Y. (Jan. '47)

Hatch, Bernard F., Partner, Burgess & Niple, Civ. & San. Engrs., 568 E. Broad St., Columbus 15, Ohio (Jan. '47)

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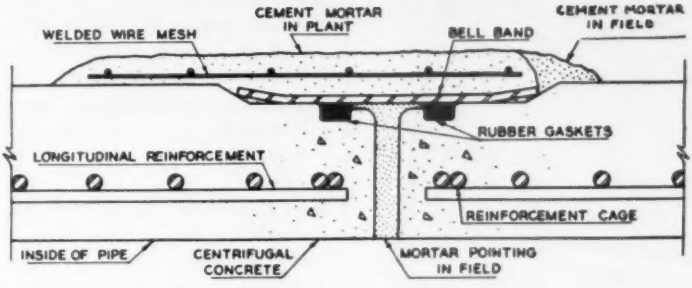

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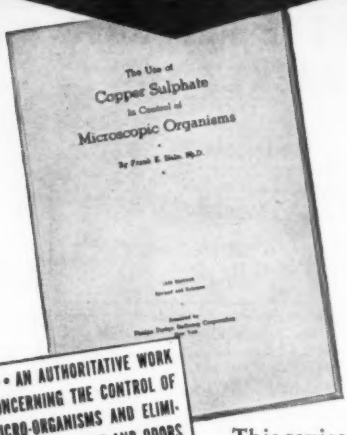

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(*Continued from page 32*)

Held, Wilmer O., City Supt., City Hall, South Milwaukee, Wis. (Jan. '47)

Hester, R. W., *see* Community Public Service Co. (Fort Worth)

Hoganson, Lester O., Cons. Engr., City Hall, Burlington, Wis. (Jan. '47)

Holden, E. G., San. Engr., War Dept., Officer Training School, Geiger Field, Spokane, Wash. (Jan. '47)

Hooper, William E., Gen. Mgr., Power & Water Dept., Sheffield, Ala. (Jan. '47)

Horning, William A., Mgr., Elec. Light & Water Works, Superior, Mont. (Affil. Jan. '47)

Howson, Arthur W., Engr., Alvord, Burdick & Howson, 20 N. Wacker Drive, Chicago 6, Ill. (Jan. '47)

Inspiration Consolidated Copper Co., Walter G. Scott, Metallurgical Supt., Box 244, Inspiration, Ariz. (Corp. M. Jan. '47)

Irey, George W., Supt. of Plants & Production, The Empire Dist. Elec. Co., 602 Joplin St., Joplin, Mo. (Jan. '47)

Jacobson, George L., Asst. Prof. of Civ. Eng., South Dakota School of Mines & Technology, Rapid City, S.D. (Jan. '47)

Jeffords, Russell M., Geologist, Dept. of Geology, Brown Univ., Providence, R.I. (Jan. '47)

Jemian, S. C., Sr. Structural Engr., 6409—45th Pl., Riverdale, Md. (Jan. '47)

Johnson, Wallace, Supt. of Water, Water Dept., City Hall, Huron, S.D. (Jan. '47)

Jones, Hugh, Engr., Macco-Robertson Co., 811 Paramount Blvd., Clearwater, Calif. (Jan. '47)

Kalinske, A. A., Chief Hydr. Engr., Infilco, Inc., 325 W. 25th Pl., Chicago, Ill. (Jan. '47)

Karstens, M. Chauncey W., Engr., The Engineer Board, Fort Belvoir, Va. (Jan. '47)

Kilpert, Richard, Design Draftsman, American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y. (Jan. '47)

King, Charles E., Supt., Water & Light Dept., 329 N. 3rd St., East Grand Forks, Minn. (Jan. '47)

Kneale, John S., Dist. Repr., The Permutit Co., 517 Hamilton National Bank Bldg., Chattanooga 2, Tenn. (Jan. '47)

Kramer, Howard H., *see* Petoskey, Mich., City of

Lawson, Warren Robert, Asst. Public Health Engr., State Dept. of Health, Div. of Sanitation, University Campus, Minneapolis 14, Minn. (Jan. '47)

Lemasters, Paul R., Sr. Engr., Indianapolis Water Co., 113 Monument Circle, Indianapolis 6, Ind. (Jan. '47)

Lockwood, H., Domestic Water Foreman, 145 Main St., Penticton, B.C., Can. (Jan. '47)

Mawdsley, Alar B., Water Supt., 112 E. 2nd, Pratt, Kan. (Jan. '47)

McChesney, Don R., Sales Engr., The Permutit Co., 1139 Enquirer Bldg., Cincinnati 2, Ohio (Jan. '47)

McCleary, E. L., Mgr., Water Com., Dallas, Ore. (Jan. '47)

McClung, L. R., Supt. of Distr., Wate Dept., Danville, Va. (Jan. '47)

McWayne, Albert, Engr., Perkins & McWayne, 320 Paulton Bldg., Sioux Falls, S.D. (Jan. '47)

Meyer, William George, Asst. Supt., Water Dept., Box 209, Fairmont, W.Va. (Jan. '47)

Mitchell Water Dept., J. C. Scallin, City Engr., Mitchell, S.D. (Corp. M. Jan. '47)

Morse, Daniel P., Asst. Engr., Indianapolis Water Co., 113 Monument Circle, Indianapolis 6, Ind. (Jan. '47)

Mortinson, Severin A., Comr. of Public Works, Board of Water Comrs., St. Paul, Minn. (Jan. '47)

Munding, Germaine G., Chemist in Charge of Lab., New York Water Service Corp., 515 Ocean Ave., Brooklyn 26, N.Y. (Jan. '47)

Mussey, Orville D., Assoc. Engr., U.S. Geological Survey, Box 1338, University Station, Charlottesville, Va. (Jan. '47)

Nangle, B. A., San. Engr., State Board of Health, Pierre, S.D. (Jan. '47)

Nessa, Herbert, Supt., Water Dept., Forest City, Iowa (Jan. '47)

Newark Water Works, LeRoy H. Wright, Village Hall, Newark, Wayne County, N.Y. (Corp. M. Jan. '47)

Olson, C. B., Supt. of Utilities, Water & Light Dept., Ada, Minn. (Jan. '47)

Orr, L. V., *see* Water Tank Service Co.

(*Continued on page 36*)

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(*Continued from page 35*)

Palmer, H. L., Sales Engr., Uhrich Supply Co., 11th & Gentry, North Kansas City 16, Mo. (Jan. '47)

Petoskey, Mich., City of, Howard H. Kramer, City Mgr., City Hall, Petoskey, Mich. (Corp. M. Jan. '47)

Pierce, H. M., City Mgr., Aberdeen, S.D. (Jan. '47)

Price, L. E., Supt., Water & Light Dept., Box 333, Tupelo, Miss. (Jan. '47)

Ramirez, Conrado S., Eng. Div., Manila Engr. Dist., APO 75, % Postmaster, San Francisco, Calif. (Jan. '47)

Redford Township Water & Sewer Dept., Lloyd W. Fall, Supt., 15145 Beech Rd., Detroit 23, Mich. (Corp. M. Jan. '47)

Reed, Ralph, Asst. City Engr., Watertown, S. D. (Jan. '47)

Rippey, George S., Mech. Engr., 1823 S. Delaney St., Orlando, Fla. (Jan. '47)

Rose, Nicholas A., Ground Water Geologist, Lockwood & Andrews, Cons. Engrs., 904 Union National Bank Bldg., Houston 2, Tex. (Jan. '47)

Ross, Robert, Water Supt., Water Dept., Fortuna, Calif. (Jan. '47)

Rowe & Webb Eng. Service Co., Cons. Engrs., W. P. Rowe, 2635 Main St., Riverside, Calif. (Corp. M. Jan. '47)

Rowe, W. P., *see* Rowe & Webb Eng. Service Co.

Rutt, Raymond, Asst. Secy., Northern Illinois Water Corp., 105 W. Adams St., Chicago 3, Ill. (Jan. '47)

Saint John Water & Sewerage Dept., W. R. Godfrey, Supt., 74 Carmarthen St., Saint John, N.B., Can. (Corp. M. Jan. '47)

Sanborn, Robert B., Owner, Culligan Soft Water Service of Clayton, Box 5, Clayton 5, Mo. (Jan. '47)

Sanders, M. D., Chem. Engr., Swift & Co., Research Lab., Union Stock Yards, Chicago 9, Ill. (Jan. '47)

Scallin, J. C., *see* Mitchell Water Dept.

Schwarz, George M., Engr., Armco Drainage & Metal Products, Inc., 985 N. Capital St., Salem, Ore. (Jan. '47)

Scott, Walter G., *see* Inspiration Consolidated Copper Co.

Shearer, David H., Dist. Sales Mgr., Industrial Div., National Gypsum Co., 11 E. 42nd St., Richmond, Va. (Jan. '47)

(*Continued on page 38*)

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How Much? Where? When?

What is that pump actually delivering? How much water does Tract 7463 take? At what rate is the reservoir filling—or emptying?

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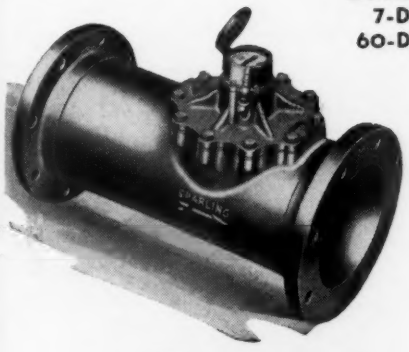

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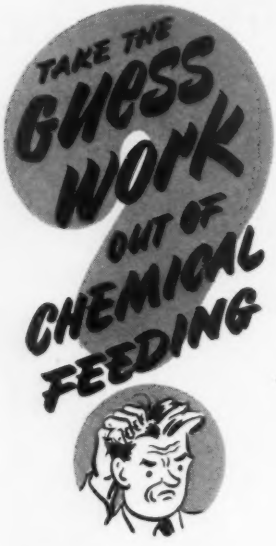

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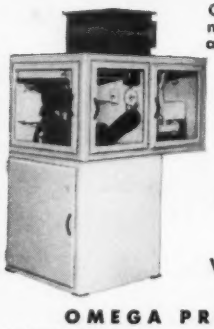

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OMEGA

(*Continued from page 36*)

Sorba, Manuel Vinas, San. Engr., Puerto Rico Aqueduct & Sewer Service, Francia 1555, Santurce, Puerto Rico (Jan. '47)

Sorbel, J. L., Dist. Engr., State Board of Health, 820 Quincy St., Rapid City, S.D. (Jan. '47)

Spieker, Roy G., San. Engr., Div. of San. Eng., State Board of Health, Pierre, S.D. (Jan. '47)

Stach, O. R., *see* Carborundum Co.

Staven, Julian, Cons. Engr., Box 508, Rapid City, S.D. (Jan. '47)

Steel, Kenneth A., Service Engr., Industrial Chemical Sales Div., 35 E. Wacker Drive, Chicago, Ill. (Jan. '47)

Tempest, W. F., Special Counsel, Cons. Bureau, Portland Cement Assn., 33 W. Grand Ave., Chicago 10, Ill. (Jan. '47)

Thompson, H. S., Partner, Brevard Drilling Co., Titusville, Fla. (Jan. '47)

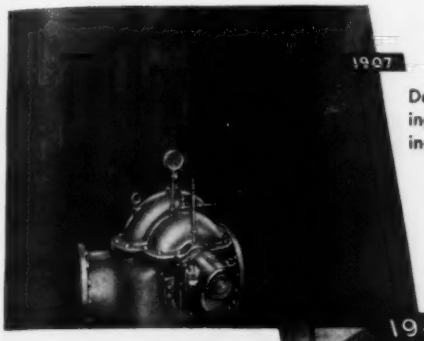
Thompson, Joseph, Sales Development, Resinous Products & Chemical Co., Washington Sq., Philadelphia 5, Pa. (Jan. '47)

Vermillion Water Dept., H. A. Fowler, Water Supt., Vermillion, S.D. (Corp. M. Jan. '47)

Water Tank Service Co., L. V. Orr, Pres., 1115 Republic Bank Bldg., Dallas 1, Tex. (Assoc. M. Jan. '47)

Webber, Weston L., Water Works Engr., Water Works, Box 783, Santa Cruz, Calif. (Jan. '47)

(*Continued on page 40*)



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De Laval geared, turbine-driven, dual pumping unit installed at the Moores Bridges Pumping Station in 1907.

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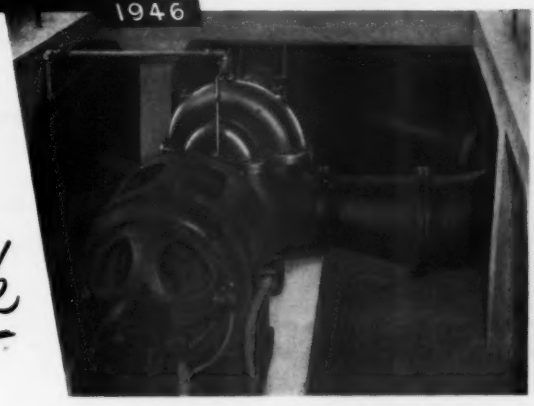
A recent installation at Moores Bridges Station, a 15 mgd, 165 foot head, De Laval unit.



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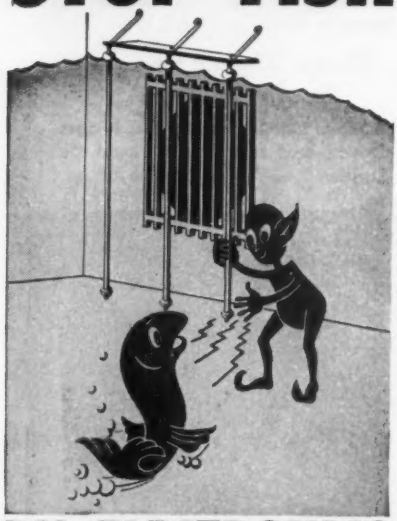

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(*Continued from page 38*)

Weinhold, George A., Dist. Mgr., The Permutit Co., 902 Francis Palms Bldg., Detroit, Mich. (Jan. '47)

Wiggins, J. M., Well Driller Contractors, Plymouth, Fla. (Jan. '47)

Wright, Herbert W., Chemist, Filtration Plant, Metropolitan Dist. Water Bureau, 14 Richard Rd., East Hartford 8, Conn. (Jan. '47)

Wright, LeRoy H., *see* Newark Water Works

Wylie, F. S., Jr., San. Engr., Air Installations, AAF Air Training Compound, Barksdale Field, Shreveport, La. (Jan. '47)

Yongen, Arnold G., Supt., Water Dept., 46 N. Ocean Ave., Freeport, N.Y. (Jan. '47)

REINSTATEMENTS

Barton, Harry, Supt., Citizens Water Supply Co., 163 Cutter Mill Rd., Great Neck, N.Y. (Dec. '28)

Cornell, Guy B., Asst. Supt., Water Dept., Crocker-Huffman Land & Water Co., Box 737, 621—17th St., Merced, Calif. (Oct. '38)

Kanto, W. P., *see* Norton, Town of

Lozada, L. A., Apdo. 451, Maracaibo, Venezuela, S.A. (Jan. '41)

Norton, Town of, W. P. Kanto, Norton, Va. (Corp. M. Jan. '25)

Stalbird, James A., Dist. San. Engr., State Dept. of Health, Paul Smith Bldg., Saranac Lake, N.Y. (Apr. '25)

LOSSES

Deaths

Groener, E. C., Installation Engr., Sloan Valve Co., 4300 W. Lake St., Chicago 24, Ill. (Oct. '23)

Jennings, Fred Huntington, Supt. of Filtration, Dept. of Water, 1146 Boyd St., Watertown, N.Y. (July '38) *P*

Manahan, Elmer G., 35 Ridgeway St., Mount Vernon, N. Y. (June '09) *P*

Price, Norman, Gen. Foreman, Repair & Meter Service, Water Works, Dewey Ave. & Bloss St., Rochester, N.Y. (July '35)

Vickrey, John U., Sewage Disposal Plant Operator, 1207 W. Las Olas Blvd., Fort Lauderdale, Fla. (July '39)

(*Continued on page 42*)

Clow-National

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CAN BE FURNISHED TO MEET THE REQUIREMENTS OF ALL EXISTING SPECIFICATIONS

SUPER-deLAVAUD CENTRIFUGALLY CAST

The standard water bell is the most common type of cast iron pipe joint—popularly known as the "bell and spigot" joint. Available in sizes 3 to 24 inches inclusive, in 12 and 18-foot lengths, and for working pressures up to 250 pounds.

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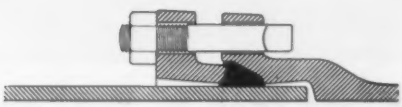
A time-saving, easily installed mechanical joint cast iron pipe now used extensively. Made in all sizes from 3 inches through 24 inches, in 18-foot lengths, and for pressures up to 250 pounds.



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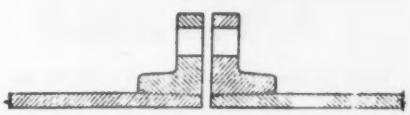
Cast iron flanged pipe is widely used for exposed pipe line work, inside and outside of buildings, for conducting water, steam, gas, oil and other fluids. Comes in same sizes and for same pressures as listed above, and in 12 and 18-foot lengths.



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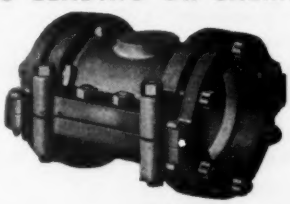

F-1200
Clow Mechanical Joint
Split Sleeve

It is better to have Clow Split Sleeves on hand and NOT need them than to NEED them and not have them.

See page 87 of catalog PIPE ECONOMY for complete detailed information

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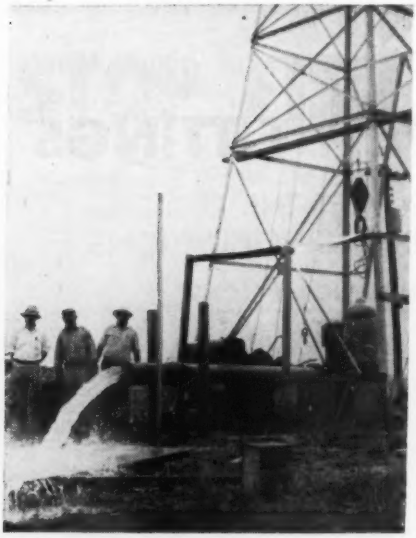

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(*Continued from page 40*)

Wells, C. P., Munic. Engr., 421—6th Ave., N., Great Falls, Mont. (Apr. '43) *P*

Williams, Howard L., Pentwater, Mich. (Aug. '94)

Resignations

Aloe, A. S., Co., St. Louis, Mo.

American Colloid Co., Chicago, Ill.

Arnold, Fay W., LaGrange, Ill.

Baker, Harold W., Rochester, N.Y.

Bastian-Morley Co., Inc., LaPorte, Ind.

Bergnes, Luis F., Caibarien, Cuba

Bremerman, E. S., St. Louis, Mo.

Buchanan, J. K., Fairmont, W.Va.

Buckingham, J. E., Raymond, Wash.

California Corrugated Culvert Co., West Berkeley, Calif.

Carl, Charles E., Jefferson City, Mo.

Carlson, Axel, Ketchikan, Alaska

Central Power & Light Co., Corpus Christi, Tex.

Cross, William P., Delaware, Ohio

Dent, Wilbur M., Sheffield, Ala.

Elliott, Earl C., Jr., San Jose, Calif.

Fink, G. J., Washington, D.C.

Fischer, Joseph C., Wauwatosa, Wis.

Flanagan, Walter H., Baltimore, Md.

Foulk, C. W., Columbus, Ohio

Gahr, William N., Bismarck, N.D.

Gibson, E. W., Portland, Ore.

Gibson, William C., Lansing, Mich.

Hauserman, William R., Cleveland, Ohio

Krater, Frank B., Independence, Calif.

Ledbetter, Charles M., Jackson, Miss.

Lehman, Werner, South Milwaukee, Wis.

Lobley, George W., Gaffney, S.C.

Massey Concrete Products Co., Chicago

McPherson, C. E., Little Falls, Minn.

Melnick, Emil, Elmira, N.Y.

Meyers, E. W., Jr., Pittsburgh, Pa.

Neill, Dwight E., Fort Morgan, Colo.

Nukem Products Corp., Buffalo, N.Y.

O'Leary, E. C., Halifax, N.S., Can.

Palmer, Henry Austin, Staines, England

Patton, David H., Atlanta, Ga.

Patton, Horace M., Washington, D.C.

Powers, Leonard T., East Grand Forks, Minn.

(*Continued on page 44*)

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576 Wall St.
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Laurence H. Daniels
P.O. Box 531
Havana, Cuba

A. Rodriquez, Inc.
P.O. Box 749
Mayaguez, Puerto Rico

Jorge Triana & Cia
Apartado De Correos No. 5
Bogota, Colombia, S. C.

J. Vicenti Gutierrez
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Caracas, Venezuela

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Plaza de La
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3718 NORTHERN BLVD.
LONG ISLAND CITY 1, N.Y.

(*Continued from page 42*)

Preedom, Louie M., Bossier City, La.
Reinhardt, Charles O., Champaign, Ill.
Ridenour, W. E., Philadelphia, Pa.
Rosen, Milton, St. Paul, Minn.
Rothchild, H. A., Kimberly, Wis.
Rouses Point, Village of, Rouses Point, N.Y.
San Antonio Chamber of Commerce, San Antonio, Tex.
Scheuner, Herbert A., La Crescenta, Calif.
Soehren, W. L., Dallas, Ore.
Stauffer, S. Walter, Washington, D.C.
Steel Pipe Research Institute, Toronto, Ont., Can.
Sterling Engine Co., Buffalo, N.Y.
Trout, Fred I., Tupelo, Miss.
Van Den Berg, C., Jr., Birmingham, Ala.
Walker, Lewie D., Toronto, Ont., Can.
Webb, S. W., Cadillac, Mich.
Welsford, H. R., Philadelphia, Pa.
Whitney, Alfred C., St. Paul, Minn.
Williams, Charles P., San Diego, Calif.
Wrench, Joseph, New York, N.Y.

Changes in Address

Changes received between January 5 and February 5, 1947

Abell, D. S., San. Engr., The China Sanitary Eng. Service, 110 Szechuen Rd., Shanghai, China (Nov. '32)

Acevedo-Quintana, F., Designing Engr., Bellevue No. 359, Las Palmas, San Juan, Puerto Rico (Jan. '41)

Alter, Amos J., Director, Div. of Sanitation & Eng., Dept. of Health, Box 378, Juneau, Alaska (Apr. '42)

Axelrad, B. A., % Freeport Sulphur Co., Drawer A, Freeport, Tex. (Apr. '39) *P*

Barker, Stanley T., Route 9W, Bethlehem Center, Glenmont P.O., N.Y. (Jan. '40) *P*

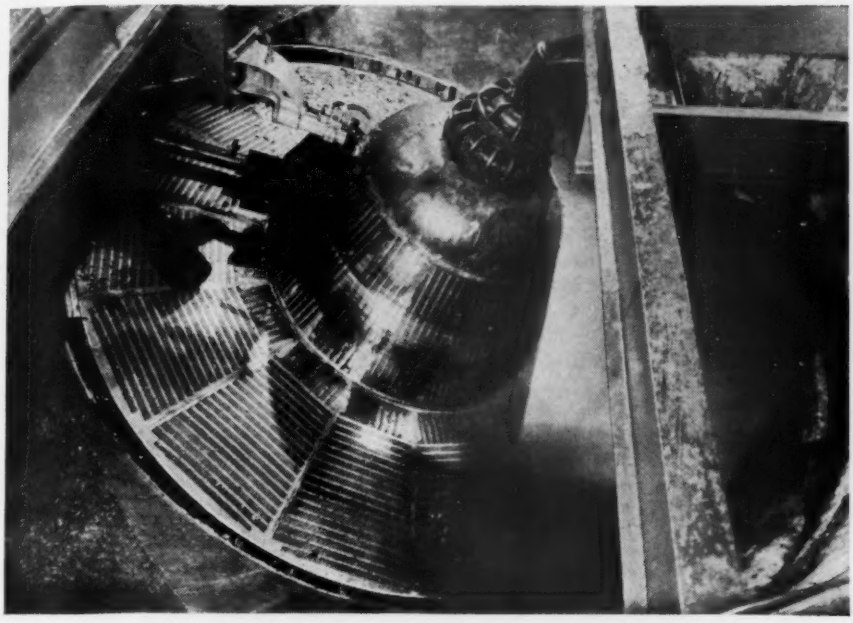
Berkowitz, Sidney A., 4 W. Oak St., Arcadia, Fla. (Jan. '46) *MP*

Boriss, Marion E., 21 City Hall, Chattanooga 2, Tenn. (Jan. '44)

Bready, Ira J., Dist. Mgr., Liquid Conditioning Corp., 1201 Traction Bldg., Cincinnati 2, Ohio (Jan. '38) *P*

Brook, David W., 420 N. Buckeye St., Osgood, Ind. (Jan. '46)

(*Continued on page 46*)



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Two of these screens, designed and installed by Krajewski-Pesant Mfg. Corporation, are in service at the Jamaica Sewage Treatment Plant of the City of New York, removing solids and flocculent material to prepare sewage waters for subsequent activation.

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It is this unusual combination of properties that dictates the use of Everdur where operating requirements are most severe. For detailed information, write for Publications E-11 and E-5. 46219-A

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In four grit ejectors: Everdur for gate slides and cylinders, piston rods, valve stems, bolts and nuts.

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(*Continued from page 44*)

Burt, Burke, 216 S. College St., Tucumcari, N.M. (July '42) *P*

Caldwell, David H., 5711 Cabot Drive, Oakland 11, Calif. (Jan. '41) *P*

Carnegie & Smith, S. Steve Carnegie, 3000-A Dalrymple Drive, Baton Rouge, La. (Corp. M. Apr. '46)

Clayton Mfg. Co., Glen W. Duncan, Gen. Sales Mgr., Valve Div., 1812 Lemon St., Alhambra, Calif. (Assoc. M. Oct. '39)

Coblentz, Maurice H., Lt.Col., Sr. San. Engr. (R), San. Eng. Consultant, U.S. Public Health Service, Region 6, National Housing Agency, 821 Market St., San Francisco, Calif. (Aug. '29) *P*

Collins, Willis E., Purification Corp., 2406 W. Lunt Ave., Chicago 45, Ill. (Apr. '46)

Corbin, Malcolm D., 6911 Forrer St., Detroit 10, Mich. (Apr. '43)

Corson, Benjamin I., 120 Woodland Terrace, Oaklyn, N.J. (Jan. '41)

Davis, Jack, Dist. Mgr., Iowa Valve Co., 1508 S. Kenneth Ave., Chicago 23, Ill. (Apr. '43)

Deutsch, Fred W., 111 Auburn St., Cranston, R.I. (Apr. '45) *P*

Dixon, Robert M., Prof. of San. Eng., Texas A & M College, College Station, Tex. (Apr. '38) *MP*

Dose, Herman W., 1417 Belcher, Gainesville, Tex. (Apr. '44) *M*

Eaton, Thomas J., Supt., Water Dept., Public Service Co. of New Mexico, Santa Fe Div., Santa Fe, N.M. (July '35) *MP*

Ebsary, W. F., 915 E. Emma St., Tampa, Fla. (Jr. M. Oct. '45)

Edwards, W. G., Cons. Engr., 2809 Isabella St., Houston, Tex. (Oct. '44) *AMP*

Ferguson, George E., % Water Resources Branch, U.S. Geological Survey, Washington 25, D.C. (July '41) *Director* '46–'48. *P*

Fiesler, Frederick A., San. Engr., Water & Sanitary Sec., 145 E. High St., Edwardsville, Ill. (Jan. '44) *MP*

Flemming, John G., Box 3566, Oklahoma City, Okla. (Apr. '46)

Forsyth, Joseph R., 150—95th St., Brooklyn 9, N.Y. (Jan. '46) *P*

Fraser Utility Supply Co., R. J. Fraser Jr., 3046 Andrita St., Los Angeles 41, Calif. (Assoc. M. Oct. '38)

Gentner, Warren A., 2 American Row, Hartford 3, Conn. (Jan. '42) *AMP*

Gibbs, Fred S., 308 United Bldg., 43 Leon St., Boston 15, Mass. (July '41) *P*

Glick, Dudley P., 508 Sylvan Ave., Glen Olden, Pa. (Apr. '43) *P*

Graves, H. D., 830 Tejon St., Denver, Colo. (Apr. '46)

Grime, Edwin M., 215 S. Lexington Pkwy., St. Paul 5, Minn. (July '26) *P*

Hanson, Arthur M., 330½ Main St., Neenah, Wis. (Oct. '43) *P*

Hess, Irving C., Engr., California Water & Telephone Co., Box I, National City, Calif. (Jan. '41)

Heyward, Nathaniel J., 636 E. 15th St., Bedford, Ind. (July '45) *P*

Hopkins, Edwin W., 233 Broadway, New York 7, N.Y. (Aug. '25) *M*

Horstmann, F. B., Chem. Engr., 4340 S.W. 9th St., Miami, Fla. (June '27) *P*

Howell, Eugene M., Public Health Engr., San Joaquin Local Health Dist., Stockton, Calif. (Jan. '37) *MP*

Hubbard, Robert L., Water Works & Drainage Contractor, 121 Browers Lane, Roslyn Heights, N.Y. (Apr. '46)

Hunter, H. G., 1226 University St., Montreal, Que., Can. (June '11) *P*

Ingram, William T., 20 Point Crescent, Malba, N.Y. (July '35)

Jacobs, L. L., Chief San. Engr., Air Univ., Maxwell Field, Montgomery, Ala. (July '35)

Karr, Roy W., Sales Repr., Mueller Co., 5576 N.E. Sandycrest Terrace, Portland 13, Ore. (Jan. '38)

Kauffman, James B., Assoc. Engr., Bureau of Water Supply, 704 Charing Cross Rd., Baltimore 29, Md. (July '42)

Keeler, Russell B., 5417 Lemon Grove Ave., Los Angeles 38, Calif. (Apr. '44) *MP*

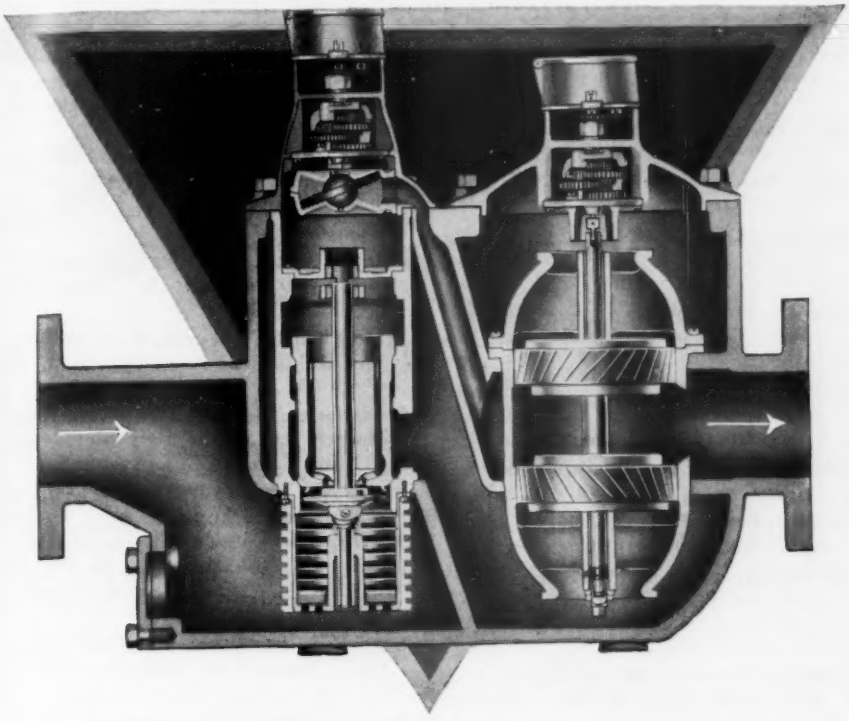
Kenney, Norman D., 5707 Chilham Rd., Baltimore 9, Md. (Jan. '41) *P*

Kittrell, Francis W., Tennessee Valley Authority, McNutt Bldg., Knoxville, Tenn. (July '35)

Knowlton, Kenneth F., 74 Conant St., Beverly, Mass. (Jan. '43) *MP*

Lamb, Carter H., 155-01—90th Ave., Jamaica 2, N.Y. (Jan. '38) *AM*

(*Continued on page 48*)



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(*Continued from page 46*)

Lawrence, Frederick H., 145 W. Sharpnack St., Philadelphia 19, Pa. (Mar. '24) *P*

Link, Roy E., Supt., 2460 Florence Ave., Huntington Park, Calif. (Jan. '42) *M*

Lowe, Harry N., Jr., 1st Lt., ShC, AUS, 307 "C" St., Lynchburg, Va. (Apr. '44)

Ludwig, Harvey F., 1305 Violeta Drive, Alhambra, Calif. (July '39) *Goodell Prize '43. P*

Luquire, Joseph W., Jr., Luquire Eng. Co., 255 St. Francis St., Mobile, Ala. (July '44) *AP*

Lynch, Leonard, Chem. Control Engr., South Dist. Filtration Plant, 3300 E. Cheltenham Pl., Chicago, Ill. (Apr. '46)

Mason, Warren L., 2653 Brookside Ave., Indianapolis 1, Ind. (Affil. Jan. '45)

McKee, Frank J., 110 E. Dayton, Madison 3, Wis. (Jan. '44) *MP*

McMullen, Oliver A., Sr., Chief Engr. & Operator, Water Dept., 34 N. Gladstone Ave., Margate City, N.J. (Oct. '45) *MP*

Meinzer, Oscar E., 2923 S. Dakota Ave., N.E., Washington 18, D.C. (July '42)

Miles, Henry J., Prof. of Hydraulics, Texas A & M College, College Station, Tex. (July '41) *P*

Miller, J. Wallace, Pres., W-M Corp., 608 S. Dearborn St., Chicago 5, Ill. (Jan. '46) *MP*

Morrill, Arthur B., San. Eng. Director, U.S. Public Health Service, % American Embassy, APO 909, San Francisco, Calif. (Oct. '25) *P*

Muddiman, J. B. C., 1002 N. Jackson St., Wilmington, Del. (July '39)

Newland, S. H., Dist. Mgr., Wallace & Tiernan Co., Inc., 1262 Commonwealth Ave., Boston 34, Mass. (Oct. '39) *P*

Nicholls, F. R., Asst. Engr., 46 Bridge Rd., Chessington, Surrey, England (Jan. '46)

Nilmeier, Herbert P., Dist. Public Works Dept., 717 Buchanan St., Albany 6, Calif. (Jan. '45) *P*

Norgaard, John T., 1715—39th Ave., San Francisco 22, Calif. (Jan. '45) *AMP*

Oakmont, Munic. Authority of Borough of, W. H. Bottelsen, Mgr., 748 Allegheny River Blvd., Verona, Pa. (Corp. M. Apr. '09)

Ott, L. H., *see* Rheem Research Products

Pedroso, Mario, Pres., Electroquimica de Saqua S.A., Metropolitana 340–341, Havana, Cuba (Oct. '41)

Plummer, Raymond B., 411 S. Perry St., Montgomery, Ala. (Oct. '43) *P*

Pollard, L. Melvin, City Engr., City Hall, Sunnyvale, Calif. (Jan. '46)

Potter, Walter, Engr., % Vincent P. Potter, 19 Somerset St., Somerville, N.J. (Jan. '43)

Price, Philip G., Salesman, R. W. Sparling, 3104 S. Michigan Ave., Chicago 16, Ill. (Apr. '43) *M*

Prodanovich, Danilo, Capt., Engr., Headquarters 7th Army, Fort McPherson, Atlanta, Ga. (Jan. '44) *P*

Pulhamus, Aaron, Jr., Supt., Dept. of Public Works, 17 Boyle Ave., Totowa Boro, N.J. (Oct. '44)

Rheem Research Products, Inc., L. H. Ott, 170 E. California St., Pasadena 5, Calif. (Corp. M. Apr. '43)

Ripley, H. A., Davis, Ripley & Assoc., Cons. Engrs., 207 Williamson Bldg., Edmonton, Alta., Can. (Oct. '44)

Roetman, Edmond T., San. Engr., American Viscose Corp., 312 Shaw Rd., Ridley Park, Pa. (Feb. '34) *P*

Schlie, Everett H., Illinois Central Ry. Co., Passenger Station, Dubuque, Iowa (Apr. '42) *P*

Sichler, Vance A., Gen. Delivery, El Paso, Tex. (Apr. '44) *P*

Smallwood, Charles, 112 Pierce Hall, Cambridge 38, Mass. (Jr. M. Jan. '46) *P*

Smith, Edwin F., Layne-Western Co., Box 3776, St. Louis 22, Mo. (Apr. '41)

Smolinski, R. C., Water Supt., The Washington Water Power Co., 609 Main St., Lewiston, Idaho (Apr. '46)

Smouse, John P., 4785 Munger Rd., Ypsilanti, Mich. (June '31) *P*

Solomon, C. H., City Engr. & Water Dept. Supt., 206 Kickapoo St., Hiawatha, Kan. (Jan. '46)

South Boston, Town of, Z. M. Wilborn, Water Supt., South Boston, Va. (Corp. M. Apr. '45)

Stephens, Felton, 904 W. St. Johns Ave., Austin, Tex. (Jan. '44) *M*

Stradling, F. P., Mgr., Bristol County Water Co., Bristol, R.I. (Dec. '24) *M*

(*Continued on page 50*)

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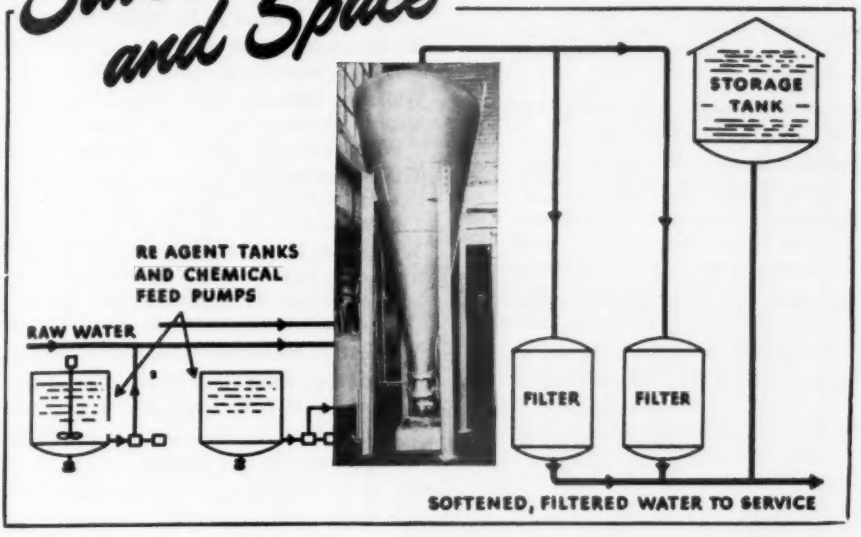

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WATER CONDITIONING HEADQUARTERS

(*Continued from page 48*)

Stratton, Robert D., 129 Melbourne Terrace, Waterbury 47, Conn. (July '45)

Straub, Conrad P., Sr. Asst. San. Engr., U.S. Public Health Service, Water & San. Investigations, E. 3rd & Kilgore Sts., Cincinnati 2, Ohio (Jan. '40) *P*

Sussman, Sidney, Liquid Conditioning Corp., 114 E. Price St., Linden, N.J. (Jan. '45) *P*

Sydow, William, 2376 S.W. 21st St., Miami 35, Fla. (July '38)

Taggart, Robert S., 14 Romeyn Ave., Amsterdam, N.Y. (Apr. '37) *P*

Tarbett, R. E., San. Engr. Director, U.S. Public Health Service, 407 Carroll Ave., Takoma Park 12, Md. (July '21) *P*

Taylor, D. R., Asst. City Mgr., Municipal Bldg., Roanoke, Va. (Sept. '33) *Fuller Award '42. M*

Trygg, Charles E., 4716 McPherson Ave., St. Louis 8, Mo. (Oct. '42) *P*

Tucker, Belden S., % American Consulate, Belem, Para, Brazil, S.A. (July '45)

U.S. Pipe & Foundry Co., Thomas Simons, Southern Sales Mgr., 1711 1st National Bank Bldg., Birmingham, Ala. (Assoc. M. Nov. '29)

Vaughn, J. C., Filtration Engr., South Dist. Filtration Plant, 3300 E. Cheltenham Pl., Chicago 49, Ill. (Jan. '36)

Waddingham, Fred C., 302 W. Nelson Ave., Puente, Calif. (Jan. '46)

Walasyk, Edward, Asst. Engr., Hackensack Water Co., 4100 Park Ave., Weehawken, N. J. (Apr. '43) *M*

Waller, Robert O., Filtration Engr., South Dist. Filtration Plant, 3300 Cheltenham Pl., Chicago 49, Ill. (May '33)

Whittaker, H. A., Prof. of Public Health Eng., School of Public Health, Univ. of Minnesota, Minneapolis 14, Minn. (June '13)

Wilborn, Z. M., *see* South Boston, Town of

Williamson, James E., 62 Paterson Ave., Hempstead, N.Y. (July '43)

Wilson, Albert E., Jr., 2700 Elsinor Ave., Baltimore 16, Md. (Jan. '41) *P*

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Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

SERVES FOR CENTURIES

(*Continued from page 24*)

WISCONSIN SECTION MEETING

The twenty-fifth anniversary meeting of the Wisconsin Section was held at the Hotel Northland, Green Bay, Wis., on November 15–17, 1946. A new attendance record of 272 was set, exceeding by 18 the previous high established in 1945. Section membership at the time of the meeting reached a new high total of 133.

As in the past all meetings opened with the showing of a motion picture to reduce the interruption of speakers by the usual opening confusion. Section Chairman Harold Londo, who presided at the opening session, welcomed the members present and pointed out that the program had been arranged to bring Wisconsin water works men up to date on modern methods and techniques, particularly as they related to the difficulties of present-day operating problems. He then introduced Green Bay's Mayor Dominic Olejniczak, who welcomed the delegates and called attention to the importance of water utilities, indicating that the health and safety of any community were dependent upon them. A.W.W.A. Vice-President N. T. Veatch then discussed "Water Supply as an Industry." A.W.W.A. Secretary Harry E. Jordan spoke on "Association Activities," spending the major portion of his time discussing the problems which arise in the water works field due to the elimination of controls. Pointing out that the November elections had shown quite clearly that people were tired of a controlled economy, he suggested that the elimination of all controls might make it extremely difficult for a utility to get the necessary materials to serve adequately the housing projects which are being developed all over the country.

K. V. Hill, Cons. Engr., Greeley & Hansen, Chicago, closed the meeting with his paper on "Treatment Plant Operating Costs" (Jour. A.W.W.A., **39**:151 (1947)).

At the afternoon management session, presided over by A. P. Kuranz, Mgr., Waukesha Water Works, George E. Symons, Assoc. Editor, *Water and Sewage Works,* was the first speaker. Presenting the subject "How Are Your Relations—Public That Is?" he punctuated his talk very cleverly with anecdotes to bring home his point that water works men must learn to get along with their customers.

"The Employees Retirement Plan" was discussed in two phases. First, T. M. McGuire, Mgr., Plymouth Utilities, explained the operation of the Wisconsin Plan as now in effect and in use in many of utilities throughout the state. Then, F. G. McNamara of the Old Line Life Insurance Co. of America, speaking on private programs, brought out the important fact that a private company plan is a definite commitment which will be met regardless of future conditions, as compared with the operation of a governmental plan, wherein any deficit would be made up by the governing body

(*Continued on page 56*)

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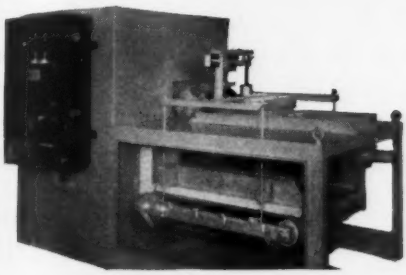

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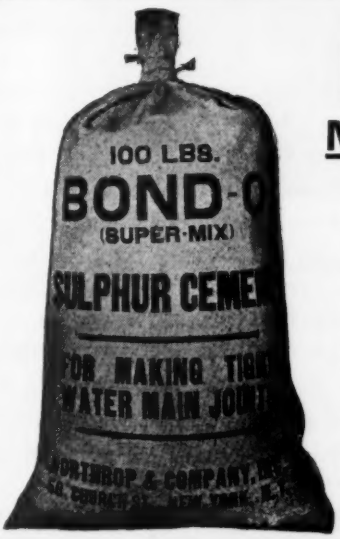

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(*Continued from page 54*)

by a subsidy in the form of increased taxes on the general public. The discussion which followed brought out these points more clearly and it was agreed that, although the state plan theoretically was actuarily sound, it was practically not so because of possible fluctuation in interest rates.

The third discussion, on "Salaries and Wages of Water Works Managers, Superintendents and Employees," was introduced briefly by A. P. Kuranz who acted as moderator. In his introduction he raised the question: "Can the A.W.W.A. do something to improve the lot of the people in charge of the water works in the community; and if it can, should it; and what should be done?" Since this was definitely an open question, the subject evoked immediate discussion from the floor which ended only when it became time to adjourn. Upshot of the comments was that each man has a job to do in his own community, even insofar as establishing salaries and wages and conditions of employment which will fit into the general local industrial picture as nearly as possible. Several speakers stressed the fact that water works men are not performing merely governmental functions, but functions comparable to those in the highest type of industry, so that compensation should also be comparable.

James E. Kerslake, Supt. of Filtration at Milwaukee, presided at the surface water supplies session, held on the morning of the second day. H. C. Schmitt, Asst. Supt. of Filtration, Milwaukee, presented a paper on "Repairing a Surface Wash System" and Harry A. Faber, Research Chemist, Chlorine Institute, New York, discussed "Contemporary Chlorination Practices" (*see* this JOURNAL, pp. 200 & 237).

The ground water session which followed was presided over by Verne Somers, Supt., Stevens Point Water Utility. Opening the discussions was a progress report on ground water studies in Wisconsin by Frank Foley, geologist in charge of the co-operative study being carried on by the U.S. Geological Survey and the Univ. of Wisconsin. William Gallaher, Supt., Water Filtration Plant, Appleton, and H. F. Weckwerth, Supt., Electric Water Utilities, Kaukauna, co-operated in presenting a paper on "Some Economic Aspects of Softening" (Jour. A.W.W.A., **39**:147 (1947)).

The session closed with a resume of ground water supplies of Wisconsin by H. E. Wirth, San. Engr., State Board of Health (Jour. A.W.W.A., **39**: 93 (1947)). Sources of ground water supplies used by public utilities were considered in some detail, and data were presented on the occurrence of water-borne diseases.

James W. Myers Jr., Supt., Kenosha Water Dept., presided at the session on distribution systems held on the last day of the meeting. First on this program was E. M. Griffith, Engr., Racine Water Dept., who discussed water main sterilization as practiced at Racine, citing many experiences requiring repeated treatments in order to get a safe sample. He pointed out that the greatest source of contamination was the hemp jointing ma-

(*Continued on page 58*)

Cuts Pumping Costs 50 Percent

The City of Bryan, Ohio, reduced its pumping costs about 50 percent when it installed the 400,000-gal. elevated tank shown above in its distribution system. The tank also allows the City to pump a large proportion of the water consumed at off-peak periods when demands for power are low and thus relieves the peak load on the municipally-owned power plant. Write our nearest office for quotations when drawing plans for water works improvements. State capacity, height to bottom and location.

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(*Continued from page 56*)

terial. To overcome this source of infection, Racine now sterilizes the hemp in an autoclave, after which the reels are placed in a completely closed sterile box and dispensed through a small opening. Only enough is withdrawn and cut off for a single joint. The hemp is carefully handled and is kept as free from contamination as possible while the joint is being made. Another practice adopted at Racine is to spray the interior of each length of pipe with a chlorine solution before laying. This is accomplished by pumping the solution through a perforated pipe cap which is fitted to a length of ¾ in. pipe which is drawn through the length of main. A paper on "Losses in Distribution Systems" was presented by Dewey Johnson, Engr., Cast Iron Pipe Research Assn. (*see* Jour. A.W.W.A., 39:157 (1947)).

R. E. Cannard, Gen. Mgr., Manitowoc Public Utilities Com., who led the panel discussion on design and construction, briefly described the redesign of Manitowoc's system on a 50-year plan. He pointed out that the Manitowoc Council had, through proper changes in the ordinances and regulations, authorized the commission to lay water mains wherever they were needed and permitted them to install transmission mains to eliminate dead ends without levying assessments against the abutting property.

J. P. Schwada, City Engr., and Arthur Rynders, Research Engr., both of Milwaukee, related that city's sad experiences with sulfur compound jointing materials, and described the manner in which joints were actually cut out, sampled and analyzed for sulfur content. The fact that disintegration was evident in every sulfur compound joint examined, led them to the conclusion that the estimated probable life of these joints was 33 years. Milwaukee has 163 miles of pipeline joined by sulfur compound joints and as yet has no answer for the problem of protecting these joints.

Jerome C. Zufelt, Supt., Sheboygan Water Dept., spoke briefly on valve spacing and reported that Sheboygan policy was to so space the valves that shut-offs in residential districts did not shut down more than two blocks of main; in industrial areas, four valves are installed at each intersection. Zufelt stressed the importance of valve accessibility and suggested that as a minimum standard all valves 12 in. and larger be housed in manholes. He emphasized also the need for periodic inspections of valves.

Walter A. Peirce, Mgr., Racine Water Dept., observed that it appeared advisable to place a valve on each side of large industrial services in congested areas to minimize service interruption to large consumers.

The Fuller Award was awarded to James W. Myers Jr., "for his outstanding accomplishments in the reduction of water losses at the Kenosha Water Dept. and for his constant and keen interest in section activities."

L. A. Smith
Secretary-Treasurer

(*Continued on page 60*)

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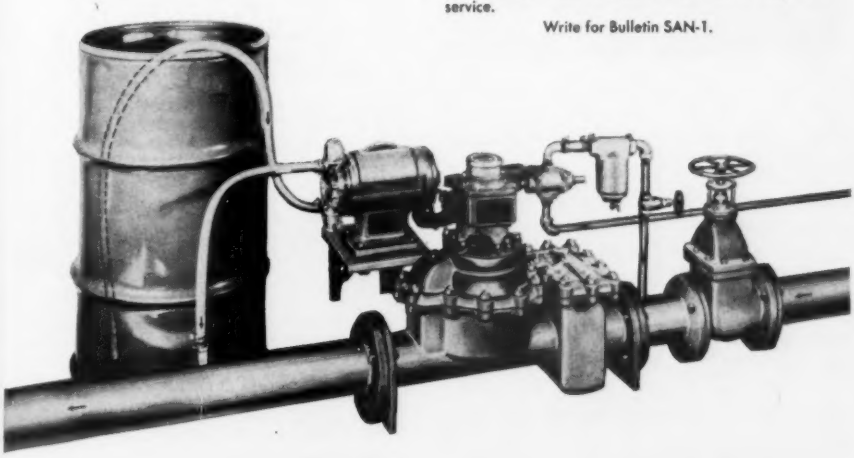

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(*Continued from page 58*)

NEW YORK SECTION MEETING

The annual mid-winter luncheon meeting of the New York Section was held January 17 at the Commodore Hotel in New York City in conjunction with the annual convention of the American Society of Civil Engineers.

On the program were addresses by Earl O. Shreve, Vice-Pres. and Public Relations Director, General Electric Co., and Jules Backman, Economist and Assoc. Prof., New York Univ., both of whom discussed the timely subject of labor and management relations. Shreve's talk presented the industrialist's view of current labor problems and Dr. Backman devoted the majority of his time to an analysis of the "Nathan Report." Following the prepared speeches, the guests led an hour's open discussion of wage and labor problems, answering many questions from the floor.

Other features of the program were a business session and the introduction of newly elected Honorary Members Malcolm Pirnie and John H. Cook and A.W.W.A. vice-presidential nominee Linn H. Enslow.

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UNIVERSAL
CAST IRON PIPE
LAID WITH ONLY WRENCHES
NO CAULKING MATERIALS
NO GASKETS. NO BELL HOLES TO DIG.

For water supply, fire protection systems, sewage disposal systems, industrial, and irrigation. Flexible.

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THE CENTRAL FOUNDRY COMPANY
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Gentlemen: Send us information and catalog on UNIVERSAL CAST IRON PIPE.

NAME _____
STREET _____
CITY _____

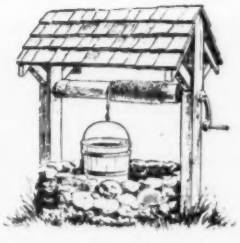
NEWS OF THE FIELD

Soil conservation and a balanced program of forestry control and use should command the interest and support of every water works man. The water supply of our American cities depends far more than many of us realize upon these activities. The American Forestry Association has recently prepared a statement on the subject which merits repetition here:

> Forests are a basic natural resource of the United States.
>
> Forests provide wood and many other materials for the needs of our people and for the employment of labor and capital in industry and on farms.
>
> Forests support domestic and foreign trade.
>
> Forests conserve and regulate inland waters essential for irrigation, navigation, power, aquatic life, domestic use and pleasure.
>
> Forests protect crop and other lands from erosion and deterioration.
>
> Forests furnish food and shelter for wildlife and forage for domestic livestock.
>
> Forests provide outdoor recreation, education and natural beauty, thereby promoting the health and spiritual well-being of our people.
>
> The United States is fortunate in having sufficient forest-producing lands to supply the needs of its people within the foreseeable future. These lands aggregate more than 656 million acres, or one-third the land area of the nation.
>
> One of the vital reconstruction problems now confronting America is to make this wealth of forest land contribute its maximum to American life.

Members of the A.W.W.A. who wish to keep themselves informed on the forestry program and who want to support it should write to: The American Forestry Assn., 919—17th St., N.W., Washington 6, D.C.

(*Continued on page 2*)



"Meet me at the Well"

In the Main Arena of the San Francisco Civic Auditorium

when A.W.W.A. and F.S.W.A. members turn out en masse to see what's new, talk shop, renew acquaintances, swap ideas at their joint annual conventions, from—

July 21 to July 25, 1947

(*Continued from page 1*)

Another co-operative solution of supply problems was effected recently when the neighboring cities of Saginaw and Midland, Mich., entered into an agreement to construct and operate jointly an 11½-million-dollar water system including a Lake Huron intake, 78 miles of 48- and 36-in. pipe, two pumping stations, a reservoir, and meters and chlorinators. The project, which is to be ready for service about Sept. 1, 1948, will be financed by 30-year water revenue bonds issued separately by the two cities; and all planning and construction will be supervised by a special committee of five members from Saginaw and four from Midland.

When completed, the system will be managed by a board comprised of three members from each city, elected for staggered six-year terms. This board will have the right to contract with either city for maintenance of the system and will be able to sell water along the joint line. Annual costs of operation, estimated at $110,000, are to be allocated on a basis of the amount of water used by each city.

To meet these costs and the debt service charges involved, both cities recently increased their water rates—Midland, 30 per cent; Saginaw, $4 per year per consumer. Additional revenue will be forthcoming too from sales of water to consumers outside the city limits. Rates for such service, which will be determined by the city involved and the joint board, are expected to approximate twice the city rates.

Two Michigan universities recently announced special programs which tie in closely with the efforts of the water works field to advance the art through improved personnel training procedures.

On May 5 and 6, the *University of Michigan* School of Public Health will present its second "In-Service Training Course for Water Works Personnel," offering a comprehensive technical review, analysis and interpretation of the basic scientific considerations involved in problems foremost in the attention of water plant operators. All water works men able to attend are invited to the sessions, which will be conducted by a special faculty group including Drs. G. A. Rohlich, W. B. Sarles, C. C. Ruchhoft, Thomas Francis and G. M. Ridenour, and Messrs. C. T. Butterfield and R. J. Faust. The main subjects of discussion will be the causes of water supply tastes and odors, the bactericidal properties of chloramines and free chlorine, the epidemiology of poliomyelitis and the efficacy of water purification methods in control of the polio virus.

It is expected that this course, presented at the request of the A.W.W.A. Michigan Section, will attract the same wide interest among qualified technical men in water purification practice and research that resulted from the first program given approximately two years ago.

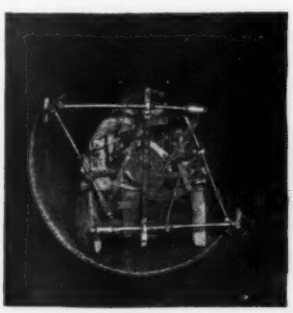
Meanwhile, the *Wayne University* School of Public Affairs has announced opening of the William Volker Fellowships in citizen leadership

(*Continued on page 4*)

. . . . . UNCLE SAM

CENTRILINES AT THE CANAL

. . . **CENTRILINE** has recently reconditioned for the Government, the 58,000 feet of 30 and 36 inch cast-iron pipe line from Gamboa Pumping Station to Miraflores, Panama Canal Zone. The increased carrying capacity will now be permanently maintained by the thin, dense, smooth cement mortar lining centrifugally applied—a reliable guarantee against future tuberculation, underlying deterioration of metal and increased pumping costs.



The Centriline process is a rapid, economical method of reconditioning pipe lines 30" and larger. After cleaning, a thoroughly premixed cement mortar lining of desired thickness is applied centrifugally without rebound. This dense quality product is mechanically trowelled to a smooth finish providing maximum carrying capacity which is permanently sustained. This work is performed underground, in place.

CENTRILINE PROCESS

CENTRILINE CORPORATION

142 Cedar Street, New York 6, N. Y.

RESTORES AND PROTECTS PIPE-LINE CARRYING CAPACITY

(*Continued from page 2*)

and public administration for 1947–1948. Under this program, ten or more fellowships of $1,200, plus tuition and fees if not otherwise provided, are offered to male graduate students of demonstrated ability to provide a field-work and academic program of training through an academic year of instruction furnished by the university and a year of concurrent field work under the supervision of the Detroit Bureau of Governmental Research. These fellowships, which are in addition to any other educational rights, are granted by the National Training School for Public Service. Satisfactory completion of the academic work, field training and thesis leads to the degree of Master of Public Administration.

Application blanks and full details are obtainable from Lent D. Upson, Director, National Training School for Public Service, 5229 Cass Ave., Detroit 2, Mich.

The Third Industrial Waste Utilization Conference will be held at Purdue Univ., Lafayette, Ind., on May 21 and 22, under the chairmanship of Don E. Bloodgood, Assoc. Prof. of San. Eng. Proceedings of the second conference are now available from the university.

(*Continued on page 6*)

On Call . . .
to tell your story for you!

Willing Water wants work on or as your public relations staff. Let him be your spokesman to your customers . . . to your personnel. You'll find him a master of the art of putting across your ideas...of soliciting co-operation ...of establishing good will. Call him up...put him to work on your publicity, your signs, your bulletins, your bills, your reports...you'll find him ready, able and, of course, willing.

Low-cost blocked electrotypes or newspaper mats, in 32 different poses, are immediately available to you. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
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Contaminated Water Supplies?

GET % PROPORTIONEERS % CHEM-O-FEEDER

The discovery of harmful organisms and disease germs in your water supply is something to get excited about . . . destroy them by hypochlorination with %Proportioneers% Heavy Duty Chem-O-Feeder — the modern way to protect the health of your community. There's no risk of dangerous undertreatment or the disagreeable taste resulting from wasteful overtreatment. By simply turning a knob, the chemical feeding rate may be instantly adjusted while the pump is operating . . . up to 7 g.p.h. can be fed with extreme precision.

Sterilization of water supplies becomes entirely automatic with the Chem-O-Feeder cross-connected to the starting switch of the main pump motor. No skilled help is required as there is none of the danger that goes with using deadly chlorine gas. The chemical being fed shows plainly in the "See-Thru" plastic head and the action of the check valves and diaphragms is clearly visible. In addition to handling hypochlorite solution, the Heavy Duty Chem-O-Feeder successfully feeds all other water treating chemicals — soda ash, lime slurry, aqua ammonia, activated carbon, sulphates, ferric chloride, polyphosphates, etc.

Heavy Duty Chem-O-Feeder

For help with your chemical feeding problems write %Proportioneers, Inc.%.

Ask for Bulletin SAN-2.

% PROPORTIONEERS, INC. %

61 CODDING STREET • PROVIDENCE 1, R. I.

(*Continued from page 4*)

An index of manufacturers' agents in the water works field, together with records of organizations represented and territories covered, is now being drawn up by A.W.W.A. headquarters. Since such a list will enable the Association to establish direct contacts between buyers and local sales representatives, all parties involved should benefit from developing a complete list and keeping it up to date. Your co-operation in providing the necessary information is therefore requested if you employ agents or represent manufacturers of water works products. Address all replies to the JOURNAL, attention Managing Editor.

A job opportunity for several graduate mechanical, chemical or civil engineers experienced in sales work has been offered by one of the Association's manufacturer members who produces a heavy specialty product sold throughout the field. The men selected are to receive several months of training in New York, temporary assignment as assistants to older salesman in established territories and then, depending upon their development, assignment to their own territories. If you are interested in applying, send a summary of your educational and business qualifications along to the JOURNAL, attention Managing Editor, and mark it Ref: 474.

American Standard Drawings and Drafting Room Practice, a revision of the ASA Z14.1 document issued first in 1935, is now available for distribution through the American Society of Mechanical Engineers, co-sponsor of the study with the American Society for Engineering Education. The new edition was prepared in response to the requests of industrial, governmental and educational institutions who found the first edition helpful in standardizing drafting room procedures and have required additional information to take into account the enormous expansion in the use of graphic language as a result of war industry and the development of new methods which have now come into common use.

Copies of the document are priced at $1.50 and may be obtained from the ASME office at 29 West 39th St., New York, N.Y.

Horace P. Clark, President and General Manager of the H. W. Clark Co., Mattoon, Ill., died February 7, two days after being stricken with ptomaine poisoning. He was 41 years of age.

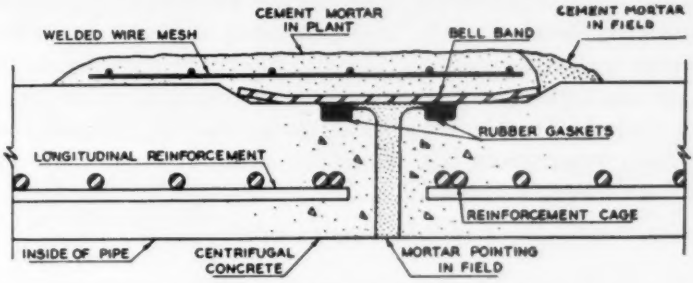
Clark left the University of Wisconsin after two years of study in mechanical engineering to become a salesman for the H. W. Clark Co., of which his father was then president. When his father died, he became sales manager of the firm, and in 1944, upon the death of his brother, he was elected President and General Manager.

(*Continued on page 8*)

ANOTHER SIGNIFICANT DEVELOPMENT BY

American
PIPE & CONSTRUCTION CO.
LONG-LASTING WATER SUPPLY LINES

HUME CENTRIFUGAL CONCRETE PRESSURE PIPE WITH DOUBLE RUBBER GASKET JOINT....



Cross-sectional View of Field Assembly

Simple — Strong — Efficient

The need for a special kind of pipe for moderate operating heads was recognized by this company over 20 years ago. Requirements included high initial and sustained carrying capacity, permanence and economy.

As a result, American pioneered the development of Hume Centrifugal Concrete Pressure Pipe in the United States. An early development with this type of pipe was in the accurate placement of steel reinforcement. Another was the proper control of concrete mixes and spinning. Then the double rubber gasket joint was developed as a final addition to an otherwise already outstanding product. This joint provides a smooth and tight-fitting bell and spigot, and contributes to greater uniformity, safety and strength in the field closure.

This simple, accurately-fitting joint provides ample flexibility, and is another example of ingenuity and engineering skill in the development of better products for water supply lines. Write for descriptive literature.

AMERICAN PIPE & CONSTRUCTION COMPANY

CONCRETE PIPE FOR MAIN WATER SUPPLY LINES,
STORM AND SANITARY SEWERS, SUBAQUEOUS PIPE LINES

P. O. BOX 3428, TERMINAL ANNEX, LOS ANGELES 54, CALIFORNIA
MAIN OFFICE AND PLANT—4635 FIRESTONE BLVD., SOUTH GATE, CALIFORNIA
DISTRICT OFFICES AND PLANTS—OAKLAND; SAN DIEGO; PORTLAND, OREGON

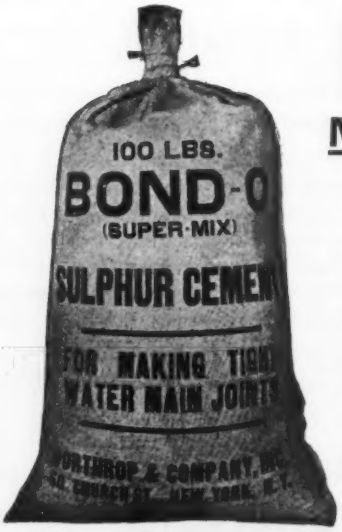
Specializing in the manufacture and installation of American Concrete Cylinder Pipe, Lock-Joint Concrete Cylinder Pipe, Pre-stressed Lock-Joint Concrete Cylinder Pipe, Hume Centrifugal Concrete Pressure Pipe.

(*Continued from page 6*)

Honolulu, Hawaii, which now has a 3½-million-dollar water works improvement program under way, is planning to spend an additional 2½ million dollars in the next two years on further improvements to its overtaxed system. With a consumption of 65 mgd. now as against 30 mgd. in 1937, the city has had to provide new facilities throughout the system. Although the Federal Works Administration is contributing $1,325,000 of the amount now being expended, the city found it necessary to increase water rates and charges approximately 33 per cent last January 1 to meet the expansion needs and rising costs.

The International Association of Microbiologists has issued its program for the Fourth International Congress for Microbiology to be held at Copenhagen, Denmark, July 20–26, advising delegates to make their arrangements for accommodations and transportation immediately because of the acute shortage of housing and space. Accommodation arrangements are being made by M. Bjorneboe, General Secretary of the Congress, and transportation reservations are obtainable either through the American Express Co. or Wagon-Lits-Cook.

(*Continued on page 10*)



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BOND-O users know that our method of machine-blending is decidedly worth while. This method produces a self-caulking joint compound which is denser in structure, with less shrinkage and practically no initial seepage. Because of the wide distribution of all the minerals, any slight seepage takes up unusually fast. Compare—and you will see the difference.

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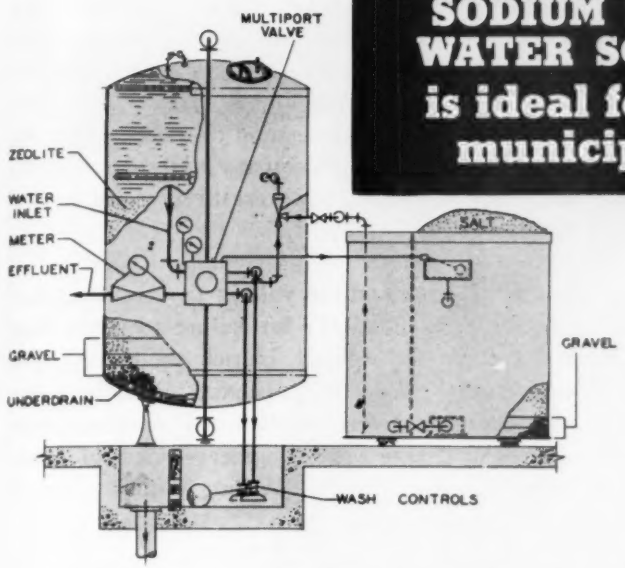
EXPORT DEPARTMENT • 11 BROADWAY, NEW YORK 4, N. Y.

Why LIQUON SODIUM ZEOLITE WATER SOFTENER is ideal for many municipalities



Write for Bulletin 5 describing LIQUON Zeolite Water Softeners, and for advice, without obligation, on any water-treatment problem.

A LIQUON Sodium Zeolite Water Softener is frequently the most advantageous method of softening hard water for households and industries, and has the following advantages as compared to other processes such as lime soda:

- **Usually occupies much less space, due to its efficient design and the use of LIQUONEX CR, the modern high-capacity non-siliceous resin type of zeolite**
- **Easier and simpler to operate, by means of an efficient single multiport valve which controls all operations with one lever**
- **The treated water is stable and does not tend to after-react, even when the raw water varies in composition**
- **Chemical costs less when non-carbonate hardness is high**
- **Handling of chemical is much less troublesome**
- **Forms no precipitates or sludge to cause disposal problems**
- **Does not add any objectionable excess of reagent to the water**
- **Can be operated under pressure and avoids re-pumping**

LIQUON equipment designs and process recommendations are based on 30 years of experience in specializing on water-conditioning problems.

LIQUID CONDITIONING CORPORATION

114 East Price Street **LINDEN, N. J.**

Engineering Service Representatives in Principal Cities

Liquon

Every Process . . . Every Type of Equipment For Conditioning of Water and Other Liquids

(*Continued from page 8*)

Another appeasement policy ended in failure recently when Los Angeles meter readers came to the conclusion that dog biscuits were ineffective as a guarantee against canine aggression. The almost immediate drop in bites that resulted when readers began to jot down the names and dispositions of the various four-footed personalities in their route books led some observers to believe that the true derivation of the term "publicity hound" had at last been discovered. Other etymologists are convinced that the good behavior results from a canine misassociation of the water works term "impound." To the Indianapolis Water Company's Hoosier realists, who have also found the pen policy successful, however, it represents merely an extension of the adage "once bit, twice shy."

The Association's public relations editor wishes to extend apologies to the Editor of *Water & Sewage Works* for failure to credit that magazine with publication of the address of A. H. Ullrich quoted on pages 7–9 of "Nuggets for Water Works Speakers," appendix to Public Relations Study 2, mailed to all members in December 1946. Proper reference for the Ullrich address as presented before the Engineers' Club of Little Rock, Ark., is hereby recorded: ULLRICH, A. H. Willing Water. Wtr. & Sew. Wks., **93**: 273 (July 1946).

Ingwald E. Flaa recently retired from his position as Hydraulic Engr. for the San Francisco Water Dept. upon reaching the age of 70. When he graduated from the Univ. of California in 1909, Flaa went to work for the Spring Valley Water Co., which at that time was supplying water to San Francisco. Then in 1930, when the company was purchased by the city, he stayed with the organization in charge of its hydraulic engineering division.

Taking over Flaa's position as acting head until civil service examinations for the permanent position are given will be Carl A. Lauenstein, Civ. Engr. with the department since 1924.

(*Continued on page 12*)

NATIONALLY APPROVED APPLICATORS OF ANTI-RUST AND ANTI-CORROSIVE COATINGS FOR ELEVATED TANKS, STAND PIPES, PENT STOCKS AND OTHER WATER WORKS INSTALLATIONS. **NO-OX-ID, BARRETT'S** AND OTHER APPROVED PROTECTIVE COATINGS APPLIED BY EXPERTLY TRAINED MEN.

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WATCH DOG WATER METERS

The meter used by thousands of municipalities in the U. S. and abroad

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SURE TO MEET YOUR SPECIFICATIONS FOR ACCURACY, LOW MAINTENANCE, LONG LIFE

Before you invest in water meters, get acquainted with the design and performance advantages which make Worthington-Gamon Watch Dog Water Meters first choice of so many municipalities and private water companies in the United States.

WATCH DOG WATER METERS

"Watch Dog" models . . . made in standard capacities from 20 gpm up; frost-proof and split case in household sizes. Disc type, Turbine type or Compound type. Write for Bulletin.

08-2A

WORTHINGTON-GAMON METER COMPANY

296 South Street, Newark 5, New Jersey

Subsidiary of

WORTHINGTON

PUMP AND MACHINERY CORPORATION

(*Continued from page 10*)

John P. Smouse, who returned to civilian life after more than three years in the Army Sanitary Corps in November 1946, is now enrolled at the Univ. of Michigan School of Public Health as a candidate for the degree of Master of Public Health under a fellowship administered by the U.S. Public Health Service. Prior to his entry into the service, Smouse was employed by the St. Joseph, Mo., Water Co.

William D. McIlvaine Jr. was recently appointed Director of Eng. Extension Services at the Univ. of Alabama. In this position, he will be concerned with college grade engineering courses at the Univ. extension centers in Birmingham, Mobile and Montgomery, with specialized courses of value to industry and government and with engineering short courses and conferences.

McIlvaine previously was Filtration Mech. Engr. at Chicago's South Dist. Filtration Plant. In addition to numerous engineering assignments prior to his work in Chicago, he also was at one time instructor at the Univ. of Minnesota and performed association, research and editorial work for the American Public Works Assn.

(*Continued on page 14*)

SYNTRON

100% Self-Contained
Gasoline Hammer

PAVING BREAKERS

Speed Up Those Emergency Jobs!

BUSTING Concrete—CUTTING Asphalt—DIGGING Hardpan, Clay and Shale—to get to broken mains, etc.

No compressor to tow around—no hose to kink and snarl—no battery to carry—just one piece of equipment that can be stowed in your service truck, ready for use.

Write for catalog folder

SYNTRON CO., 418 Lexington, Homer City, Pa.

72 lbs. "SMALLER"

GRINNELL SOCKET FITTINGS

are easier to handle . . . cut installation time

● The 72 lb. weight advantage of this 8" Tee is typical of the space and time saving advantages of Grinnell's compact design in its complete line of socket fittings. See table for comparable sizes and weights of other popular sizes of Tees.

Socket and spigot dimensions and wall thickness are the same as AWWA Standard Class D pipe. Friction loss is not increased. Underwriters' Laboratories approved.

Write for catalog: "Water Works Specialties". Grinnell Company, Inc., Providence 1, Rhode Island. Branch Warehouses in Principal Cities.

TEE

	Grinnell		Competition	
	WEIGHT	RUN FROM BELL TO BELL	WEIGHT	RUN FROM BELL TO BELL
4"	96 lbs.	11 in.	128 lbs.	22 in.
6"	147 lbs.	13½ in.	200 lbs.	24 in.
8"	222 lbs.	16 in.	294 lbs.	26 in.
10"	325 lbs.	19 in.	395 lbs.	28 in.
12"	417 lbs.	21½ in.	512 lbs.	30 in.

GRINNELL

FOUNDED 1850

WHENEVER **PIPING** IS INVOLVED

(*Continued from page 12*)

Herman A. Janzen recently left his post as Asst. San. Engr., Kansas State Board of Health, to do sanitary engineering work for the Institute of Inter-American Affairs at Belem, Brazil. In reporting his change of address to A.W.W.A. headquarters, Janzen sent the following "S.O.S.": "Since I'll be over a hundred miles from home, I may be looked upon by some as being an expert. That is where the JOURNAL will be of great help."

F. P. Stradling, who on February 1 began his thirtieth year in the employ of the American Water Works & Electric Co., became manager of Bristol County (R.I.) Water Co. on January 1. His long service began when he was employed as cashier for the Muncie, Ind., Water Works Co. in 1918. Since that time he has been Mgr. of the Kokomo, Ind., Water Works Co., Asst. Mgr. at East St. Louis, Ill., Asst. Plant Mgr. in the company's New York office and Vice-Pres. of several operating subsidiaries. Stradling has been an Active Member of the A.W.W.A. since 1924.

J. Arthur Carr, Supt., Ridgewood, N.J., Water Dept., recently took the occasion of the department's twenty-fifth annual report to tell the story of the history and progress of the village's water supply through the more than two decades of controversy between private and public ownership factions and the last 25 years of successful operation under municipal control. His efforts to acquaint consumers with the background of the utility were strongly supported by the local newspapers, which devoted several columns to the story itself and to editorial comment on the unique economic success of a public enterprise that had proved to be much more than self-supporting over a quarter of a century, increasing its valuation from $450,000 to almost $2,000,000 without dipping into general tax funds on a single occasion. Not only was Carr successful in putting across his story through this means, but he obtained for his department the best possible type of public notice.

(*Continued on page 16*)

Cut Your Packing Costs!

by using

MABBS RAWHIDE PACKING

on your Pumps and Valve Stems

Frictionless — it saves power; lasts for years

Free Sample and Literature Upon Request

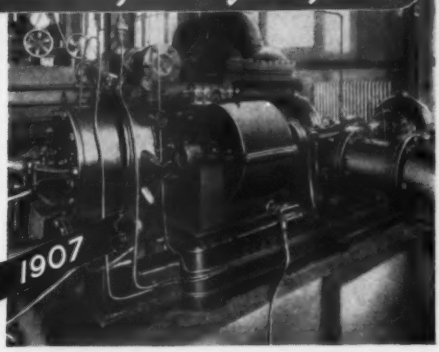
MABBS HYDRAULIC PACKING CO.

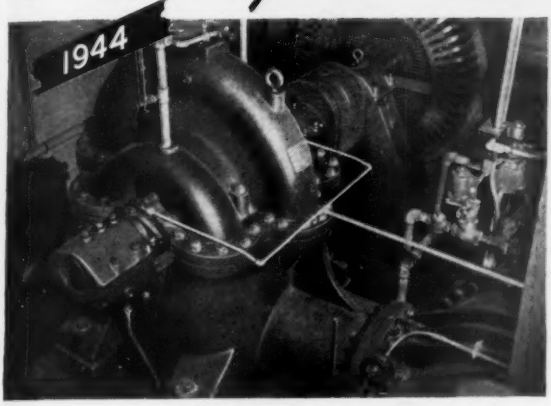
Incorporated 1892

431 S. Dearborn St. Chicago 5, Ill.

Sustained Efficiency Year after Year Brings Repeat Orders Year after Year

DE LAVAL PUMPS *at* Philadelphia





1907 *De Laval turbine-driven pump installed at Torresdale Station, Philadelphia in 1907.*

1944 *De Laval 25 m.g.d., 245 feet head pump installed at Lardners Point Station, Philadelphia in 1943.*

Since the installation of the first De Laval centrifugal water works pump at Philadelphia in the year 1907, that city has purchased a total of 37 pumping units from De Laval, so satisfactory has been their performance. The repeated installation of De Laval pumps by that city has been due in no small measure to the high sustained efficiencies maintained over long periods of use by De Laval pumps—a fact substantiated by tests made on two units at the Shawmont Station, Philadelphia, where no measurable loss of efficiency was evident after six years of service.

4114

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

(Continued from page 14)

Donald L. Snow, U.S. Public Health Service San. Engr. assigned to the staff of the Pan American Sanitary Bureau, is now serving as acting secretary of the newly organized Inter-American Assn. of Sanitary Engineering, which is to serve the interests of the 21 American republics.

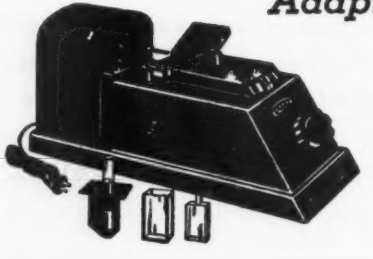
Harvey Doane, who, as Manager of the Halifax, N.S., Public Service Com., made Halifax "water" conscious by making it "Willing Water" conscious, has resigned his position to return to the managership of the Standard Paving Maritime Ltd., a construction firm with which he worked for 14 years before organizing the commission. Taking over supervision of the commission in his place will be Ira P. Macnab, who has been the engineering member of the Nova Scotia Board of Public Utilities Comrs. for the past 15 years and Chairman of the Halifax Civic Planning Com. Macnab's extensive experience in both public and private utility operation and management throughout Canada, the U.S. and South America make him an ideal choice for the job.

It was "Willing Water" who announced the change to Halifax citizens, shedding bitter tears in his bereavement, but bursting with enthusiasm in welcoming the new manager. The commission has made it clear that Macnab will continue to retain "Willing Water" as "Adviser Extraordinary."

(Continued on page 18)

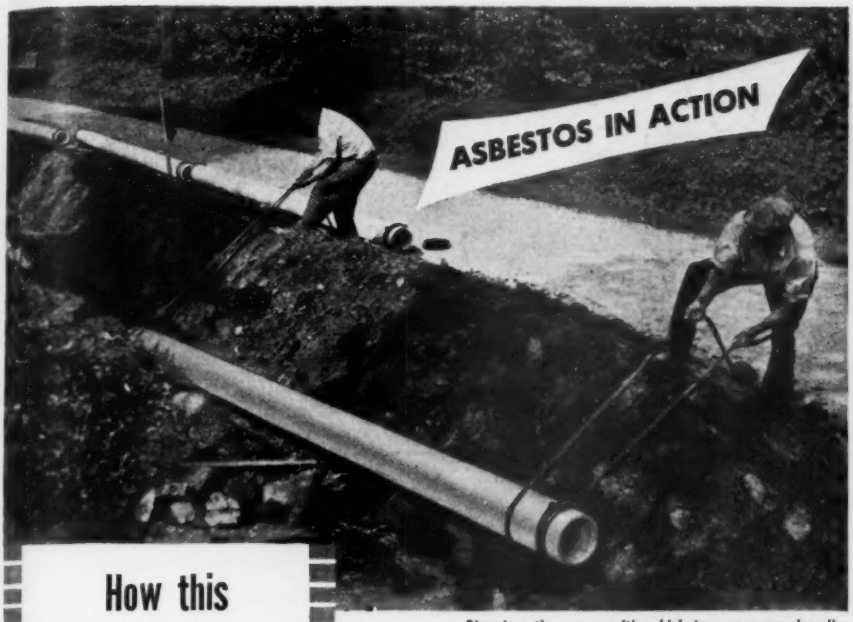
KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

KLETT MANUFACTURING CO.
179 EAST 87th STREET · NEW YORK, N. Y.



Showing the ease with which two men can handle long lengths of 8" "Century" Asbestos-Cement Pipe.

How this light weight pipe puts you ahead 4 ways

K&M "Century" Asbestos-Cement Pipe

You save four ways on *light weight alone* when you specify K&M "Century" Asbestos-Cement Pipe for mains and pipe-lines. Check these four cost-cutting advantages:

1. Lower shipping costs—substantial weight differential reflects itself in reduced freight costs . . . faster, more economical haulage to the work site.

2. Lower handling costs—two men can easily handle long lengths of "Century" Pipe—no expensive mechanical handling equipment is needed.

3. Speedier installation—because of its light weight, "Century" goes down quicker, speeds completion of the job.

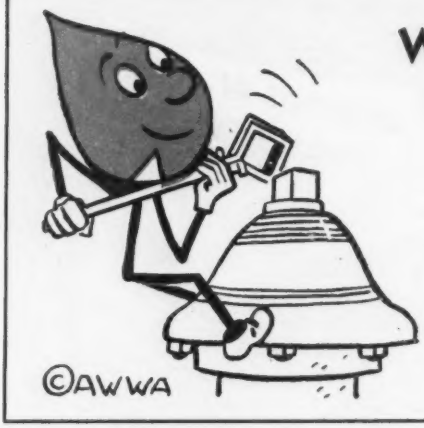
4. Reduced labor expenses—the smaller crews made possible by "Century" Pipe's light weight result in substantial labor savings.

You realize further economies, too . . . for once the line is down, "Century" Pipe is virtually maintenance-free. It's immune to tuberculation, corrosion, electrolysis . . . is strong, durable, actually grows *tougher* with age. Salvage value is practically 100%. Write us for full particulars on this leader in low-cost-per-mile.

Nature made Asbestos...
Keasbey & Mattison has been making it serve mankind since 1873

KEASBEY & MATTISON COMPANY • AMBLER • PENNSYLVANIA

K&M best in asbestos



Who wouldn't flush?

Willing Water's face is pale compared with ours. We gave him the wrench. John E. Kleinhenz gave him the "raspberry" —red. And it is all too obvious why it isn't the hydrant that's flushing.

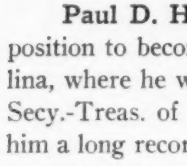
(*Continued from page 16*)

O. J. Calderara, who was released from the U.S. Public Health Service Reserve Corps last November, is now busy organizing the Suburban Tampa, Fla., Sanitary Dist. In his position as Chief Engr., Calderara will have the opportunity to carry through a public health project for which he was the foremost proponent, and will be in charge of the first Florida sanitary district serving an area entirely suburban.

Calderara's release as a Major in the USPHS terminated more than 4½ years of active service during which he completed successive assignments as San. Engr. at Washington, D.C., headquarters; Chief San. Engr. Officer on the Alaska Highway; Extra-cantonment Officer at Tampa, Fla.; and liaison officer as Public Health Specialist in Charge, War Assets Administration, Atlanta, Ga.

Paul D. Haney, formerly Kansas State San. Engr., has left that position to become Assoc. Prof. of San. Eng. at the Univ. of North Carolina, where he will work under Prof. Herman G. Baity. Haney, who was Secy.-Treas. of the new Kansas Section of the Association, leaves behind him a long record of important work toward the improvement of the state's water supply program.

(*Continued on page 22*)



Now is the time for all good men to come to the aid of their . . .

AMERICAN RED CROSS

COSTS LESS THAN A DIME

Cast iron mains go on serving for generations after the bonds issued to pay for them are retired and forgotten—saving millions in avoided replacement costs and millions in maintenance.

A big reason why a ton of pure water costs less than a dime is the long life and efficient life of cast iron pipe.

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

PUBLIC WATER SUPPLY —The Forgotten Industry

The public takes piped running water for granted—until it's turned off. A good public water supply is never news—except on the rare occasion when something goes wrong. To help create public awareness of the service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* influential readers of "Time" and "Nation's Business." For example, the following illustration and excerpts from a current advertisement:

what price water?

Cut off the water supply of this country for one week—and water would be more precious than diamonds. Water supply systems are the most vital of all public utilities. Prolonged interruptions to other public utilities would be serious. Prolonged interruption to the public water supply would be a catastrophe. There is no substitute for water!

Be appreciative of the efficient but little publicized service you receive from your community water supply system. The cost is small but the service is indispensable.

● ● ●

There is no substitute that approximates the long life and economy of cast iron pipe, the standard material for water distribution mains for over a century.

Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

SERVES FOR CENTURIES

(*Continued from page 18*)

Marvin C. Turner, former design engineer of the Austin, Tex., Water Dept., has joined with Barnes Hoff to form the partnership of Hoff & Turner for the general practice of consulting engineering, with offices in the Littlefield Bldg., Austin.

Frank E. Hale, A.W.W.A. Active Member since 1908 and Honorary Member since 1944, who retired last November from his post with the New York City Dept. of Water Supply, Gas & Electricity, reports that he is still kept busy entertaining his two grandchildren. Hale plans to spend his winters in Southern Pines, N.C., and his summers in Maine.

Murray B. McPherson, who recently returned from overseas service with the Army Sanitary Corps in Germany, is now doing graduate work in hydraulic engineering at Iowa State Univ. Having completed several engineering assignments in various posts in the U.S. and Germany, he spent his last six months overseas surveying German municipal water supplies for possible use by the Army of Occupation. Prior to entering the military, McPherson spent a year as junior engineer with the U.S. Engr. Office in the Philadelphia Dist.

Johns-Manville Corp. recently announced that construction of the second and main unit of its research center near Bound Brook, N.J., had been started. This portion of the project is to include a 3-story research building, 350 by 67 ft., and a mechanical and service building 288 by 100 ft. Meanwhile the first unit, comprising a product development laboratory and ten experimental factories in one building, 572 by 135 ft., and a water filtration and waste processing building, are almost ready.

The completed Research Center, first project in the company's 50-million-dollar expansion program, will ultimately include a group of five buildings located on a 93-acre plot across the Raritan River from the company plant at Manville, N.J. Plans for the group of buildings are being adjusted as changing needs require. The unit just started will contain facilities for physical and chemical research and testing equipment, machine shops, and administrative offices for the entire Center, as well as a library, auditorium and cafeteria for use of research personnel and visitors.

(*Continued on page 24*)

GENUINE COOK WELL STRAINERS
REG. U. S. PAT. OFF.

A. D. COOK, INC.
Lawrenceburg • Indiana
Manufacturers of
Vertical Turbine Pumps, 10 to 10,000 gpm.
Well Strainers, 2 to 40 in.
Water Systems; Shallow Well, Deep Well and Ejector
Write for Sales Literature

DEEP WELL COOK PUMPS
REG. U. S. PAT. OFF.

"HTH has no equal!"
says Everett Harris, First Engineer, Moberly Water Dep't, Moberly, Mo.
SANITATION HTH
SANITATION HTH is available in cases of nine 5-lb. cans and in 100-lb. drums.

FOR 18 YEARS, *Sanitation HTH has been used consistently by the Water Dep't of Moberly, Missouri for regular and special chlorination . . . for cleaning filtration screens . . . for treatment of coagulation basins and pipelines.*

So these comments of Mr. Harris really count: "I know what HTH can do, and I wouldn't be without it; in addition to using it every day, I insist that we keep at least 12 cases of HTH on hand for any possible emergency. In my opinion, HTH has no equal!"

Mathieson's booklet "Hypo-Chlorination of Water" describes standard sanitation practices and the many uses of Sanitation HTH. Send for your free copy today! THE MATHIESON ALKALI WORKS (Inc)., 60 East 42nd Street, New York 17, N.Y.

Mathieson
SANITATION HTH

Sanitation HTH . . Liquid Chlorine . . Chlorine Dioxide . PH-Plus (Fused Alkali) . Caustic Soda Soda Ash . . Bicarbonate of Soda . . Ammonia, Anhydrous & Aqua . . Dry Ice . . Carbonic Gas Sodium Chlorite Products . . . Sodium Methylate

(*Continued from page 22*)

A. S. Behrman, for many years Vice-Pres. & Chem. Director of Infilco, Inc., and, following his return from military service, Vice-Pres. and Director of Research of Velsicol Corp., has announced his resignation from the latter position to establish a private chemical consulting practice with offices and laboratory at 9 S. Clinton St., Chicago. Behrman will specialize in the fields of water treatment, softening and chemical patents.

Buffalo Meter Co., Buffalo, N.Y., has announced the appointment of Walter G. Boals as factory superintendent to succeed E. A. Ritter, who retired from that position on April 1 after 50 years of service with the company. Boals, who has had 34 years of experience in the metal fabricating industry, was Gen. Mgr. of the Rogers Machine Works, Alfred, N.Y., and, earlier, Plant Engr., Mfg. Div., Dresser Industries, Bradford, Pa.

A. Nelson Sayre is the new Chief of the Ground Water Div., Water Resources Branch, U.S. Geological Survey, having been appointed to that post to succeed Oscar E. Meinzer, who retired last November 30 after more than 40 years of service in the Survey and 34 years as Chief of the division. Dr. Sayre assumed his new position after 17 years of service with the U.S.G.S., prior to which he had been a member of the Univ. of Pennsylvania geology faculty for three years. In his work with the Survey, he has worked principally on ground water problems in Texas, but for the past several years has been closely associated with the headquarters office.

Early in the war, Sayre was assigned to the Military Geology Unit and directed the preparation of pre-invasion intelligence reports on water supplies covering areas held by the enemy in Africa, Europe and the Pacific Region. During this period he also made special investigations in Central America in connection with the program of the Office of Inter-American Affairs. He also made outstanding contributions in the military campaign in the Philippines under particularly hazardous conditions, for which he was awarded the Medal of Freedom.

Emil C. Groener, Installation Engineer of the Sloan Valve Co. for the past 30 years, died on January 8. An expert in all phases of flush valve engineering, he was held in high regard not only by the plumbing industry but by the architects and engineers who consulted him on many occasions. A sanitary engineer by training, Groener entered the plumbing field with the L. Wolf Mfg. Co. of Chicago, then transferred to the Sloan organization with which he stayed until his death. He became an Active Member of the Association in October 1923.

(*Continued on page 46*)

Parsons, Brinckerhoff, Hogan & Macdonald
G. Gale Dixon, Associate
Engineers

Dams Water Works Sewerage
Traffic Reports Valuations Harbor Works
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Employing Glass Color Standards

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3718 NORTHERN BLVD.
LONG ISLAND CITY 1, N.Y.

CHANGES IN MEMBERSHIP

NEW MEMBERS

Applications received February 1 to 28, 1947

Adams, G. W., *see* Stauffer Mfg. Co.

Adams, L. B., Mgr., American Cast Iron Pipe Co., Box 1491, Dallas, Tex. (Jan. '47)

Airways Water Co., Inc., Louis L. Robinson, Secy., 5158 W. 119th St., Hawthorne, Calif. (Corp. M. Jan. '47)

Ankele, M. A., Cons. Engr., Inter-State Water Co., 141 N. Vermillion St., Danville, Ill. (Jan. '47)

Arthur, S. E., Water Works Mgr., Mandan, N.D. (Jan. '47)

Bateman, Clarence E., Jr., Asst. Engr., Water Dept., Utilities Bldg., Jacksonville 2, Fla. (Jan. '47)

Baumann, Edward Robert, Graduate Asst. in San. Eng., Univ. of Illinois, Box 151, Urbana, Ill. (Jan. '47)

Bell, George R., Sr. Research Chemist, Filtration Sec., Johns-Manville Research Lab., Manville, N.J. (Jan. '47)

Borgeson, Clarence J., Supervising Civ. Engr., East Bay Munic. Utility Dist., 512—16th St., Oakland, Calif. (Jan. '47)

Brittain, Earle, Chem. Engr., U-Need-Us Coal & Chemical Co., 216 Mathews St., Painesville, Ohio (Jan. '47)

Bulpitt, Lewis M., Water Supt., Bishop, Calif. (Jan. '47)

Carman, S. P., Cons. Engr., Security Mutual Bldg., Binghamton, N.Y. (Jan. '47)

(*Continued on page 30*)

GENERAL CHEMICAL ALUMINUM SULFATE

Well cracked sludge bed shortly after Aluminum Sulfate treatment.

SPEEDS SLUDGE DRYING

General Chemical Alum speeds sludge dewatering and drying on sand beds . . . capacity of beds may be doubled, even tripled . . . quick removal lessens chance of odor nuisance . . . reduced volume of cake decreases cost of removal. Sewage works operators the nation over count on the benefits obtained from Alum treatment throughout the year.

Why not learn what General Chemical Alum will do in your plant too? Full information may be obtained quickly from the nearest General Chemical Sales and Technical Service Office listed below.

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GENERAL CHEMICAL COMPANY
FOR AMERICAN INDUSTRY ©

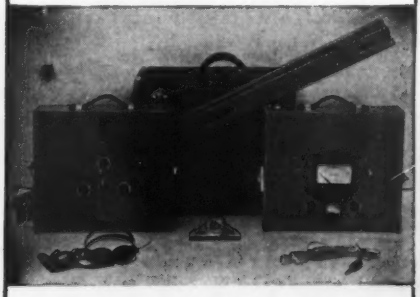
GENERAL CHEMICAL COMPANY
40 RECTOR STREET, NEW YORK 6, N. Y.

Sales and Technical Service Offices: Albany • Atlanta • Baltimore Birmingham • Boston • Bridgeport • Buffalo • Charlotte Chicago • Cleveland • Denver • Detroit • Houston • Kansas City Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh Providence • San Francisco • Seattle • St. Louis • Wenatchee and Yakima (Wash.)
In Wisconsin: General Chemical Wisconsin Corporation Milwaukee, Wis.
In Canada: The Nichols Chemical Company, Limited Montreal • Toronto • Vancouver

The Old Way

The New Way
to locate pipe

with the
M-SCOPE



. . . the instrument that takes every bit of guess work out of locating buried pipe, valves, boxes, service stubs, etc. Write for bulletin No. 6.

JOSEPH G. POLLARD CO., Inc.
PIPE LINE EQUIPMENT
145 Ashland Place, Brooklyn 1, N.Y.

(*Continued from page 28*)

Christenson, C. W., Supt., of Plants, Dept. of Water & Sewerage, Box 511, El Paso, Tex. (Jan. '47)

Clearwater Eng. Corp., Edmond Kelly, Pres., 3757 Wilshire Blvd., Los Angeles 5, Calif. (Assoc. M. Jan. '47)

Cohrs, R. W., San. Engr., Dept. of National Health & Welfare, Box 605, Halifax, N.S., Can. (Jan. '47)

Croydon Corp. Water Undertaking, William C. Knill, Water Engr. & Mgr., 3 Wellesley Rd., Croydon, Surrey, England (Corp. M. Jan. '47)

Daniels, P. N., San. Engr., 56 Maple Ave., Trenton 8, N.J. (Jan. '47)

Dardis, John J., Secy.-Mgr., Water, Light & Power Com., 200—2nd St., Proctor 10, Minn. (Jan. '47)

Dice, R. C., Salesman, McKesson & Robbins, Inc., 3515—3rd St., Des Moines 13, Iowa (Jan. '47)

Douglass, John B., Engr., West Virginia Water Service Co., 814 Peoples Bldg., Charleston 5, W.Va. (Jan. '47)

Earl, Thomas C., Supt., Water Works, Savannah, Ga. (Jan. '47)

Easthagen, J. H., Research Engr., California Research Corp., Richmond, Calif. (Jan. '47)

Ediger, Olin O., The Ediger Eng. Co., Administration Bldg., Municipal Airport, Wichita, Kan. (Jan. '47)

Erwin, Raymond A., Elec. Eng. Assoc., Los Angeles Dept. of Water & Power, 1200 Otsego St., North Hollywood, Calif. (Jan. '47)

Farrell, L. S., Sales-Water Dept., Bowser, Inc., 2843 W. 7th St., Los Angeles, Calif. (Jan. '47)

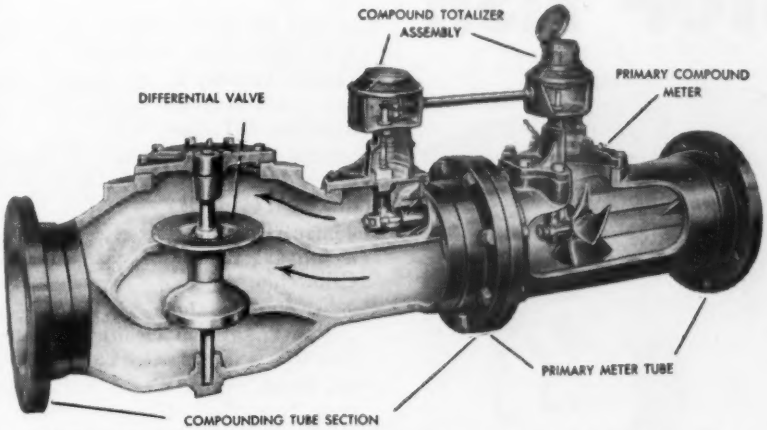
(*Continued on page 32*)

ANTHRAFILT
A Filter Medium for All Purposes

ANTHRACITE EQUIPMENT CORP.
Anthracite Institute Building
Wilkes-Barre, Penna.

All correspondence regarding sales and engineering should be addressed to:
PALMER FILTER EQUIPMENT CO.
822 E. 8th St. Erie, Pa.
Engineers and Sales Agents

SPARLING MAIN-LINE METERS



Differential valve cracks at about one pound per square inch back pressure from the smaller meter. The smaller meter measures all flows below the minimum accurate range of the larger meter. Both meters drive through ratchet clutches to a common totalizer, which thus operates with the faster turning meter.

The COMPOUND

for Main-Lines up to 36-Inch

Now, Sparling accuracy in wider flow-ranges—from 1–60 in 6-inch lines to 1–125 in 36-inch main-lines! And the lowest pressure loss of any Compound—less than 2 pounds psi. Flanged, Bell & Spigot ends.

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For prices and flow-ranges see Bulletin 309, free upon request.

R. W. SPARLING
Manufacturers of WATER MEASURING EQUIPMENT

LOS ANGELES 54. Box 3277 Terminal Annex
CHICAGO 16.....3104 South Michigan Ave.
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STOP FISH

BY ELECTRONICS

This patented fish control method employs modern electronics in overcoming a serious operating and maintenance problem. Fish of all sizes are kept at a *safe distance* from intake structures, or screens, by the use of an Electronic Control Unit. This equipment, generating special electrical impulses, energizes an electrode system designed and engineered for your particular fish control problem.

The Burkey Electric Fish Screen has been thoroughly proven through years of service in Condensing Water Intakes, Hydroelectric Plants, Water Systems and Industrial Pumping Installations.

DOES NOT STUN OR KILL FISH.

Recommended by State Conservation Officials.
Free literature and quotations upon request.

Electric Fish Screen Co.

1130 No. Poinsettia Place, Hollywood 46, Calif.

(*Continued from page 30*)

Felton, W. S., Chemist, Portsmouth Water Dept., 107 Maury Pl., Suffolk, Va. (Jan. '47)

Foreman, Phyllis L. (Miss), *see* Hydro-Elec. Power Com. of Ontario, The

Franzoso, Anthony E., Sr. Utility Operator, Johns-Manville Research Center, Manville, N.J. (Jan. '47)

Giannetti, Alfred C., Supt. of Maint., Wanaque Borough Water Dept., Wanaque, N.J. (Jan. '47)

Goldman, Oscar G., Asst. Supt., Water Dept., 425 Mason St., San Francisco, Calif. (Jan. '47)

Goode, Norman John, Sr. San. Engr., Dept. of National Health & Welfare, Box 487, Regina, Sask., Can. (Jan. '47)

Gray, Hugh, Supt., Water Works, Newport, Tenn. (Jan. '47)

Hearne, Paul W., Chief Chemist, W. D. Johnson Chemical Labs., Inc., 3908 Atlantic Blvd., Long Beach 7, Calif. (Jan. '47)

Hollowell, A. Cooley, Dist. Mgr., Badger Meter Mfg. Co., 827 Tauromee Ave., Kansas City 9, Kan. (Jan. '47)

Howell, Robert I., Water Plant Supt., Water Works System, Box 1392, Laredo, Tex. (Jan. '47)

Hunter, John M., Jr., Filter Plant Foreman, Water Dept., 1820 Russell Ave., Cheyenne, Wyo. (Jan. '47)

Hydro-Elec. Power Com. of Ontario, The, (Miss) Phyllis L. Foreman, Librarian, 620 University Ave., Toronto, Ont., Can. (Corp. M. Jan. '47)

Jackson, Burl D., Salesman, Homelite Corp., 3400 Ross Ave., Dallas 4, Tex. (Jan. '47)

Jones, C. S., Sales Mgr., Gordon & Belyea, Ltd., 101 Powell St., Vancouver, B.C., Can. (Jan. '47)

Jones, P. E., Supt., Water Dept., City Hall, Kelso, Wash. (Jan. '47)

Kaufman, A. A., Chief Engr., Water Plant, City Water Dept., W. Charles St., Humboldt, Kan. (Jan. '47)

Kelly, Edmond, *see* Clearwater Eng. Corp.

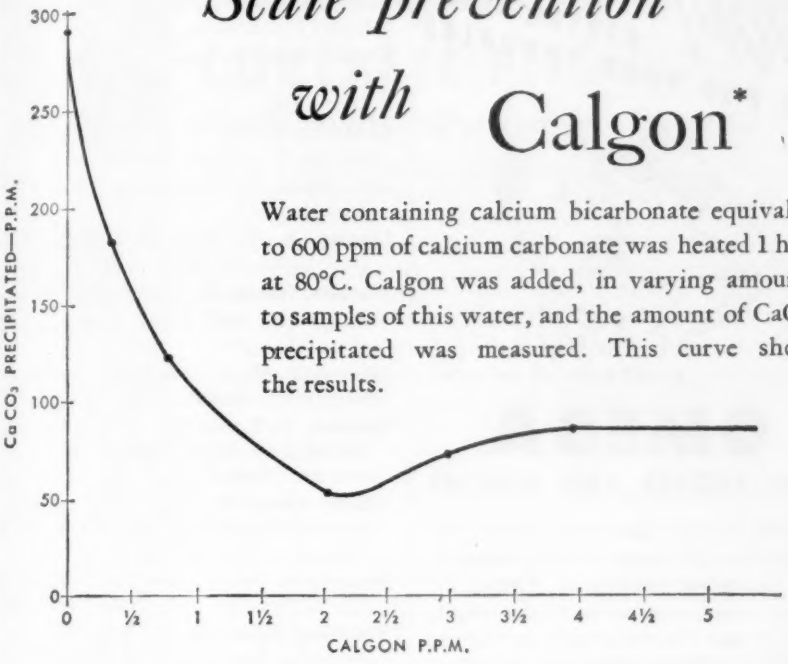
Kelly, John F., Supt., Bureau of Water, 114 Benedict St., Waterbury 65, Conn. (Jan. '47)

Kilby, H. S., Vice-Pres. of Operations, Western Light & Telephone Co., Inc., Box 763, Great Bend, Kan. (Jan. '47)

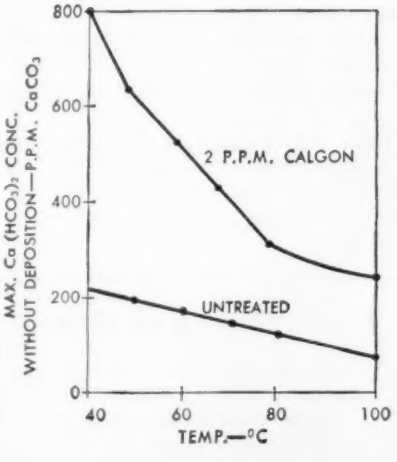
(*Continued on page 34*)

MAX. $Ca(HCO_3)_2$ CONC.

Scale prevention with Calgon*



Water containing calcium bicarbonate equivalent to 600 ppm of calcium carbonate was heated 1 hour at 80°C. Calgon was added, in varying amounts, to samples of this water, and the amount of $CaCO_3$ precipitated was measured. This curve shows the results.



Further tests were made to determine the maximum calcium bicarbonate concentration which can be maintained without deposition at different temperatures, in untreated water and in water to which 2 ppm of Calgon has been added. The results are shown in this graph.

•

Calgon in your water supply system means less trouble in mains, and distributing lines—even in home hot water heaters. We will be glad to send you full information.

**T. M. Reg. U. S. Pat. Off.*

HAGAN HALL DUDOMIN CALGON

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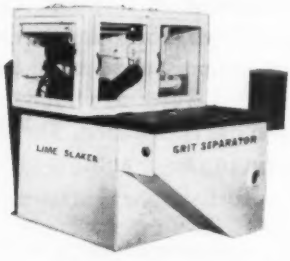
LIME FEEDERS AND SLAKERS

OMEGA Belt-type Gravimetric Feeders and Slakers are well known for their reliability and trouble-free performance. Feeding accuracy is maintained within 2% by weight; material flows from above and is continuously weighed on a short conveyor belt carried on sensitive scales. Automatic alarms and recording devices can be furnished. OMEGA high speed mixers and attachments promote unusually rapid and complete slaking. Clinkers may be removed manually or mechanically *without interrupting the operation of the slaker.*



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(*Continued from page 32*)

Knill, William C., *see* Croydon Corp. Water Undertaking

Krauss, Keith S., Dist. San. Engr., State Dept. of Health, 113 President Ct., Mason City, Iowa (Jan. '47)

La Grange Utilities, L. G. Tilton, Mgr., La Grange, Tex. (Corp. M. Jan. '47)

Lee, Ernest F., Water Supt., Bay City, Tex. (Jan. '47)

Lindsey, R. M., Supt. of Utilities, City Hall, Humboldt, Kan. (Jan. '47)

Macklin, Vincent J., Sales Engr., Neptune Meter Co., 1937 F St., Lincoln, Neb. (Jan. '47)

McConnell, M. J., Sales Engr., Municipal Supply Co., Houston, Tex. (Jan. '47)

Menzies, J. R., Sr. San. Engr., Dept. of National Health & Welfare, 379 Common St., Montreal, Que., Can. (Jan. '47)

Moses, Clarke F., Secy.-Treas. & Mgr., Public Utilities Com., Box 220, Mitchell, Ont., Can. (Jan. '47)

Moutrey, Curtis E., Supt. of Filtration, 521 N. Boulder, Tulsa, Okla. (Jan. '47)

Municipal Supply Co., R. J. Quinn, Pres., Houston, Tex. (Assoc. M. Jan. '47)

Murray, Angus M., Chief Engr. of Pumping Station & Supt. of Filtration Plant, Beach Pumping Station, Box 86, R.R. No. 5, Hamilton, Ont., Can. (Jan. '47)

Natt, George J., Asst. Hydr. Engr., State Dept. of Public Service, State Office Bldg., Albany, N.Y. (Jan. '47)

Nichols, Robert L., Box 2136, College Station, Tex. (Jr. M. Jan. '47)

Oliver, John Craig, Asst. City Engr., City Engr. Office, City Hall, Vancouver, B.C., Can. (Jan. '47)

(*Continued on page 36*)

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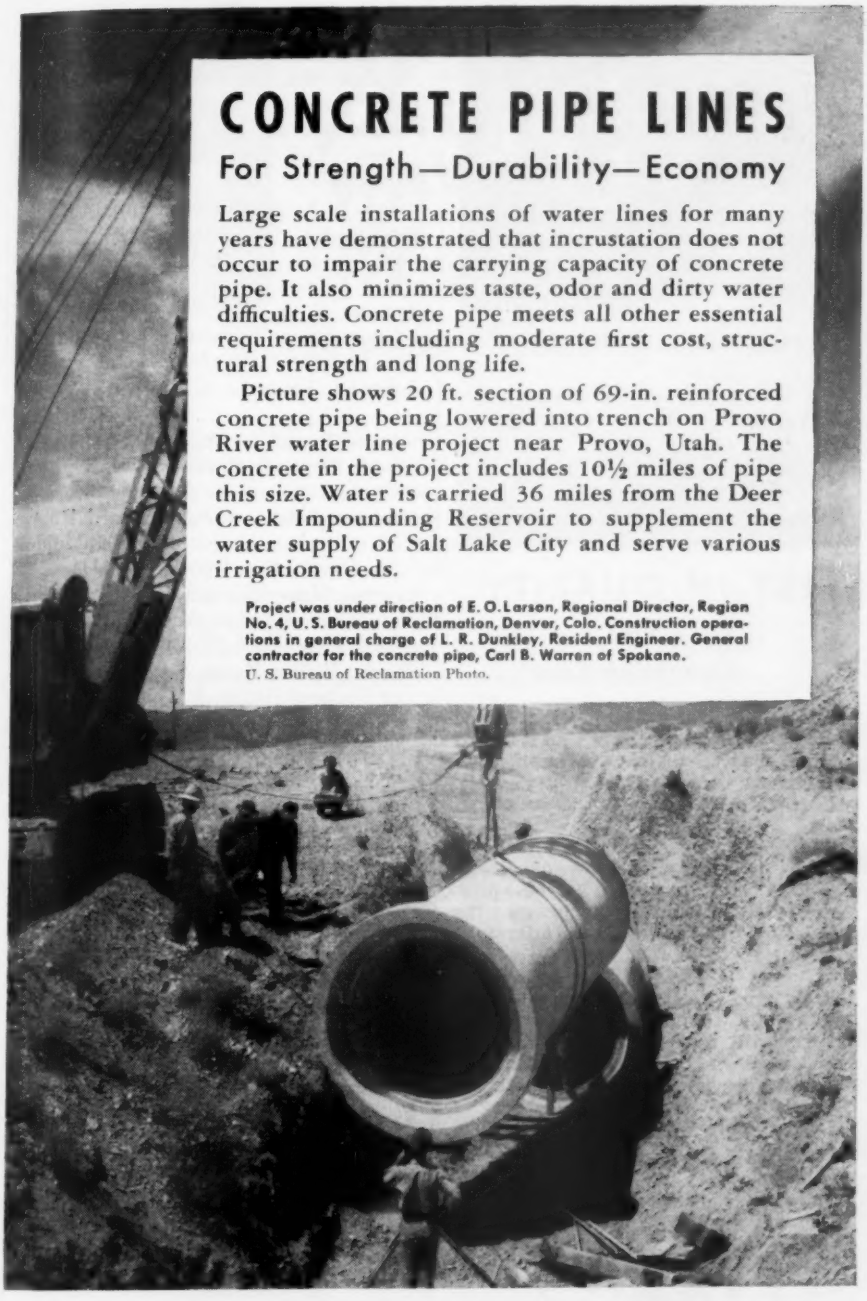

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Picture shows 20 ft. section of 69-in. reinforced concrete pipe being lowered into trench on Provo River water line project near Provo, Utah. The concrete in the project includes 10½ miles of pipe this size. Water is carried 36 miles from the Deer Creek Impounding Reservoir to supplement the water supply of Salt Lake City and serve various irrigation needs.

Project was under direction of E. O. Larson, Regional Director, Region No. 4, U. S. Bureau of Reclamation, Denver, Colo. Construction operations in general charge of L. R. Dunkley, Resident Engineer. General contractor for the concrete pipe, Carl B. Warren of Spokane.

U. S. Bureau of Reclamation Photo.

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WELLS & PUMPS

(*Continued from page 34*)

Pillsbury, Alex. H., Engr., Water Dept., Utilities Bldg., Jacksonville 2, Fla. (Jan. '47)

Powers, John B., Mgr., Water & Sewage Dept., City Hall, Breckenridge, Tex. (Jan. '47)

Quinn, R. J., *see* Municipal Supply Co.

Rider Bert A., Water Meter Man, Phillips Petroleum Co., Phillips, Tex. (Affil. Jan. '47)

Robbins, E. J., Mgr. & Secy., Mildura Urban Water Trust, Box 111, Mildura, Victoria, Australia (Jan. '47)

Robinson, Louis L., *see* Airways Water Co., Inc.

Salvato, Joseph A., Jr., Dist. San. Engr., State Dept. of Health, 35 Market St., Poughkeepsie, N.Y. (Jan. '47)

Sampson, J. A., Asst. Public Health Engr., State Dept. of Health, 1027 Des Moines St., Des Moines, Iowa (Jan. '47)

Samson, Walter Howard, Prin. Civ. Engr., Honolulu Board of Water Supply, Box 3410, Honolulu 1, Hawaii (Jan. '47)

Sharpe, Walton Kemp, San. Engr., Dept. of National Health & Welfare, Box 296, Saint John, N.B., Can. (Jan. '47)

Sillers, Russell Verne, Water Plant Supt., Water Dept., Box 141, Huntsville, Tex. (Jan. '47)

Simmons, Edward E., Jr., Research Engr., Rheem Mfg. Co., 455 S. Oakland Ave., Pasadena 5, Calif. (Jan. '47)

Smith, W. T., Supt., Water Dept., 1629 Irving St., Muskogee, Okla. (Jan. '47)

Snider, Walter A., Jr. Service Engr., Infilco, Inc., 2817 N.W. 14th St., Oklahoma City, Okla. (Jan. '47)

Speir, William D., Acting General Foreman, Water Dept., Utilities Bldg., Jacksonville 2, Fla. (Jan. '47)

Sprangel, Bert, Supt., City of Claremore, Claremore, Okla. (Jan. '47)

Stauffer Mfg. Co., G. W. Adams, Secy. Treas., 8424 Otis St., South Gate, Calif. (Assoc. M. Jan. '47)

Swanson, Walter H., Repr., Waterous Co., 80 E. Fillmore Ave., St. Paul 1, Minn. (Jan. '47)

Tilton, L. G., *see* La Grange Utilities

Toman, George J., Cons. Engr., Mandan, N.D. (Jan. '47)

(*Continued on page 38*)

Builders Flo-Watch Meter

Flo-watch METER WATCHES FLOW *Mechanically*

TOTALIZES • INDICATES • RECORDS

ONE *rugged* and *simple* mechanical instrument,—Builders Flo-Watch Meter—located on the control panel, provides complete flow information over distances up to 100 feet. The Flo-Watch Meter totalizes, indicates, and records all flow of liquid, air or gas over a range of from 10% to 100% of rated capacity. The seven-figure counter is *direct reading* i.e., shows gallons, pounds, etc., without odd multipliers. Uniform graduations and exceptionally large scale permit the indicator to be read from a distance. The twelve-inch recording chart has *uniformly spaced* graduations over the entire flow range and is available in any units of flow.

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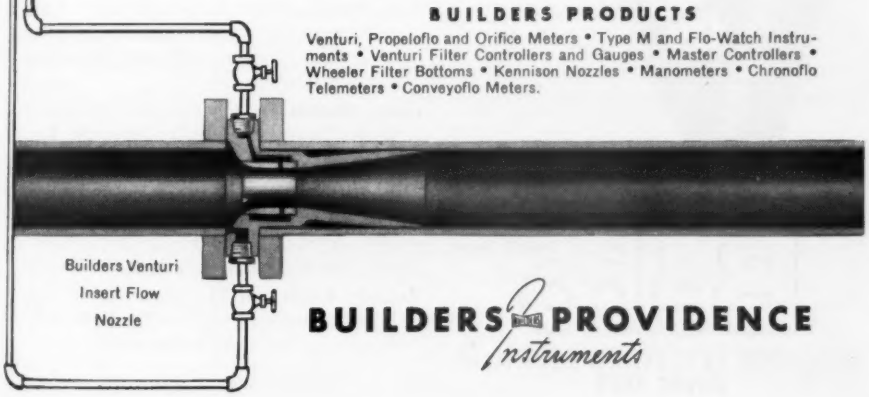

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PATERSON 3,
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(*Continued from page 36*)

Truett, Robert Ernest, Chief Operator, Water Dept., Port Arthur, Tex. (Jan. '47)

Vass, E. M., Town Mgr., Colonial Beach, Va. (Jan. '47)

Veigel, Louis Walter, Cons. Engr., Box 466, Dickinson, N.D. (Jan. '47)

Veling, John C., Repr., Waterous Co., 926 Sunnyside Ave., Chicago 40, Ill. (Jan. '47)

Walker Process Equipment, Inc., J. D. Walker, Pres., 33 Hoyt Pl., Aurora, Ill. (Assoc. M. Jan. '47)

Welker, M. C., Sales Supervisor, American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y. (Jan. '47)

Wertz, Emerson D., Civ. Engr., Emerson D. Wertz & Assoc., 101½ S. Main St., Bryan, Ohio (Jan. '47)

Wicke, Henry A., Asst. Chief Engr., Board of Water Supply, 1419 Dominis St., Honolulu 4, Hawaii (Jan. '47)

Wilkins, Jay B., Jr., Water Supt., Nederland, Tex. (Jan. '47)

Wyatt, Fred, Supt. of Meters, City Water Dept., Box 958, Billings, Mont. (Jan. '47)

REINSTATEMENTS

Brinkley, J. B., Sr., Water Supt., Federal Housing Authority, Portland 17, Ore. (July '43)

Culligan Zeolite Co., Donald L. Porth, Director of Sales, Northbrook, Ill. (Assoc. M. Apr. '38)

Evans, Samuel A., Civ. Engr., Dept. of Water & Power, Box 3669 Terminal Annex, Los Angeles 54, Calif. (Oct. '34) *A*

Fox, Paul S., Chief Engr. & Assoc. Chief of Party, Inst. of Inter-American Affairs, American Embassy, Montevideo, Uruguay, S.A. (Oct. '24)

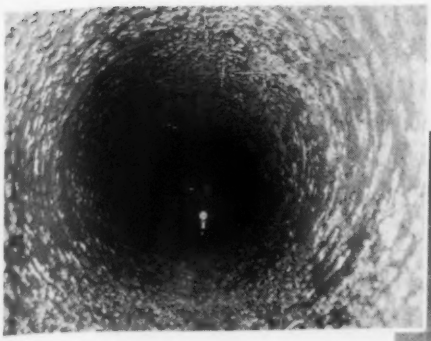
Gold, Donald D., Chemist-Bacteriologist, Water Dept., 1946 Selby Ave., St. Paul 4, Minn. (Jan. '43)

Hill, Alfred H., Vice-Pres., Francis Hankin & Co., Ltd., 2028 Union Ave., Montreal, Que., Can. (Feb. '33)

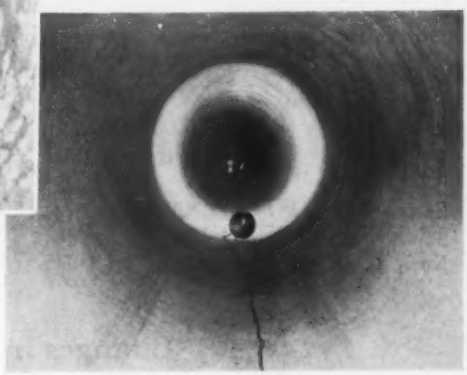
Porth, Donald L., *see* Culligan Zeolite Co.

Zollner, Frederick D., Dist. San. Engr., State Health Dept., 35 State St., Batavia, N.Y. (Affil. Jan. '40)

(*Continued on page 40*)



Newark, New Jersey, Pequannock Aqueduct No. 1. Left: Tuberculated Section before cleaning. Right: Section after cleaning and cement lining.



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(*Continued from page 38*)

LOSSES

Death

Hughes, Gresham, Mgr. & Secy., Mildura Urban Water Trust, Box 111, Mildura, Victoria, Australia (Apr. '38)

Resignations

Belyea, John F., Pres., Gordon & Belyea, Ltd., 101 Powell St., Vancouver, B.C., Can. (Mar. '34)

Cann, Leslie D., 301 N.W. 29th St., Miami 37, Fla. (Jan. '46)

Koyl, E. G., Mfrs. Repr., 5 Post Office Bldg., Winter Park, Fla. (Jan. '43) *P*

Moses, Ina M. (Miss), Acting Secy.-Treas., Water Works Dept., Public Utilities Com., Mitchell, Ont., Can. (Jan. '45)

Scott-Smith, Herbert, Supt. of Public Works, 114 Benedict St., Waterbury 65, Conn. (July '42)

Singer, Robert, Box 161, Three Lakes, Wis. (Oct. '43)

Wood, George L., Supt., Water Dept., Bishop, Calif. (Oct. '41) *AMP*

Wright, Le Roy H., Supt. of Water Works, City Hall, Newark, N.Y. (Apr. '27) *P*

Changes in Address

Changes received between February 5 and March 5, 1947

Aguilar V, J. Francisco, 4 Venida Sur 48, San Salvador, El Salvador (Jan. '46)

Baldwin, Robert Lee, Burns & McDonnell Eng. Co., c/o Country Club P.O. Station, 108 W. 63rd St., Kansas City 2, Mo. (Nov. '25)

Baum, W. S., Assoc. Engr., Burns & McDonnell Eng. Co., c/o Country Club P.O. Station, 108 W. 63rd St., Kansas City 2, Mo. (July '44)

Beckett, Humphrey, Supt., Lanham, Md. (Apr. '41) *M*

Behrman, A. S., Cons. Chem. Engr., 9 S. Clinton St., Chicago, Ill. (Feb. '25)

Buck, Ross Willis, 315 Aviation Rd., Marietta, Ga. (Apr. '43) *MP*

Carnegie, S. Steve, Public Health Engr., State Dept. of Health, 5000A Dalrymple Drive, Baton Rouge, La. (Oct. '45) *P*

Cary, William H., Jr., Director, Bureau of Public Health Eng., Dist. of Columbia Health Dept., 2106 Ross Rd., Rosemary Hills, Silver Spring, Md. (July '42) *P*

Cloroben Corp., The, Herman Seydel, Pres., 15 Exchange Pl., Jersey City 2, N.J. (Assoc. M. Jan. '46)

Collins, W. L., Repr., Viking Supply Co., 3111 Culver St., Dallas 10, Tex. (Jan. '47)

Coote, Richard, Supt. of Filtration, Box 453, Valparaiso, Ind. (Oct. '39) *P*

Critoph, Dennis, Partner, Meadows, Critoph & Co., 1155 W. Pender St., Vancouver, B.C., Can. (Apr. '46) *AMP*

Curry, James E., 1212 Tower Bldg., Washington, D.C. (Apr. '46)

Doane, H. W. L., Box 1083, Halifax, N.S., Can. (Oct. '44)

Dobson, John G., Engr., 1 Garwood Trail, Lake Arrowhead, Denville, N.J. (Jan. '45) *P*

Downs, G. H., Mgr., Crane Co., Box 2106, Billings, Mont. (Jan. '40)

Ells, J. C., 306 S. Peck Rd., El Monte, Calif. (Oct. '43) *M*

Firth, William J., Casilla 2488, Lima, Peru, S.A. (Jan. '43) *P*

Flannery, Charles A., 770 Garland Drive, Palo Alto, Calif. (Oct. '38)

Geupel, Louis A., 227 N. Piedmont St., Arlington, Va. (Nov. '22) *MP*

Grand Rapids Water Works, Joseph P. DeKorn, Supt., Monroe & Coldbrook, N.W., Grand Rapids, Mich. (Corp. M. Feb. '13)

Haney, Paul D., Assoc. Prof. of San. Eng., School of Public Health, Univ. of North Carolina, Chapel Hill, N.C. (Jan. '39) *P*

Henderlite, James H., Wallace & Tiernan Co., 1001 Commercial Bank Bldg., Charlotte 2, N.C. (Jan. '36)

Hopkins, Edwin W., 233 Broadway, New York 7, N.Y. (Aug. '25) *M*

Horstmann, F. B., 3672 S.W. 24th St., Miami 33, Fla. (June '27) *P*

Howell, Eugene M., 1717 W. Willow St., Stockton, Calif. (Jan. '37) *MP*

(*Continued on page 42*)

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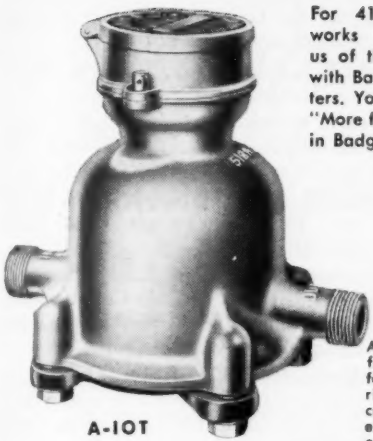

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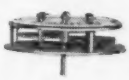

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(*Continued from page 40*)

Howland, Lee, 1863 Meadowbrook Rd., Altadena, Calif. (Jan. '41) *M*

Hudson, H. E., Jr., Illinois State Water Survey, 57 Noyes Lab., Urbana, Ill. (May '33) *Fuller Award '42. P*

Indiana Dept. of Conservation, C. H. Bechert, Director, Div. of Water Resources, 445 N. Pennsylvania St., Indianapolis 4, Ind. (Corp. M. Jan. '38)

Inertol Co., Inc., H. A. Knoedler, Western Mgr., 19 S. Park, San Francisco 7, Calif. (Assoc. M. Oct. '44)

Ingols, Robert S., Instructor, Georgia School of Technology, Atlanta, Ga. (Jan. '44) *P*

Janzen, Herman A., San. Engr., c/o American Consulate, Belem, Brazil, S.A. (Apr. '46)

Kincaid, Russell G., Assoc. Engr., Burns & McDonnell Eng. Co., c/o Country Club P.O. Station, 108 W. 63rd St., Kansas City 2, Mo. (Apr. '44) *P*

Kononoff, Alexis B., Cons. Engr., 620 N.W. 32nd St., Miami 37, Fla. (Oct. '43) *P*

Langner, Arnold W., Sr., Supt., Light, Water & Sewage Depts., 105 Guilford St., Sheboygan Falls, Wis. (Oct. '41)

Lanigan, R. L., 4071 Scheller Pl., St. Louis 16, Mo. (Apr. '46) *P*

Louis, Leo, City Engr., City Hall, Piqua, Ohio (Jan. '42) *P*

Lovejoy, William O., Sales Engr., Liquid Conditioning Corp., 1366 Homesdale Rd., Jacksonville 5, Fla. (July '43) *P*

Martin, E., Pres., Martin & Goold Water Corp., Box 186, Temple City, Calif. (Oct. '40) *AM*

Mathews, C. K., Chief Engr., Burns & McDonnell Eng. Co., c/o Country Club P.O. Station, 108 W. 63rd St., Kansas City 2, Mo. (July '44)

Mathisen, Harold M., Secy.-Gen. Mgr., La Habra Heights Mutual Water Co., 2603 E. Whittier Blvd., Whittier, Calif. (Jan. '46)

(*Continued on page 44*)

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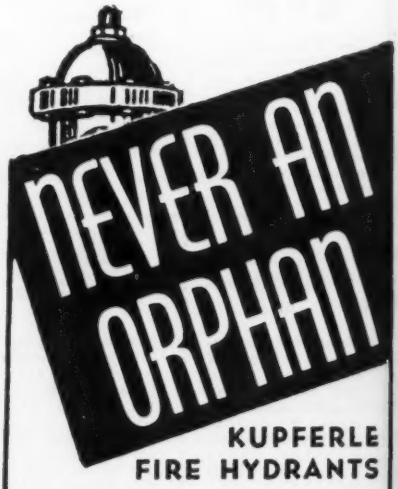

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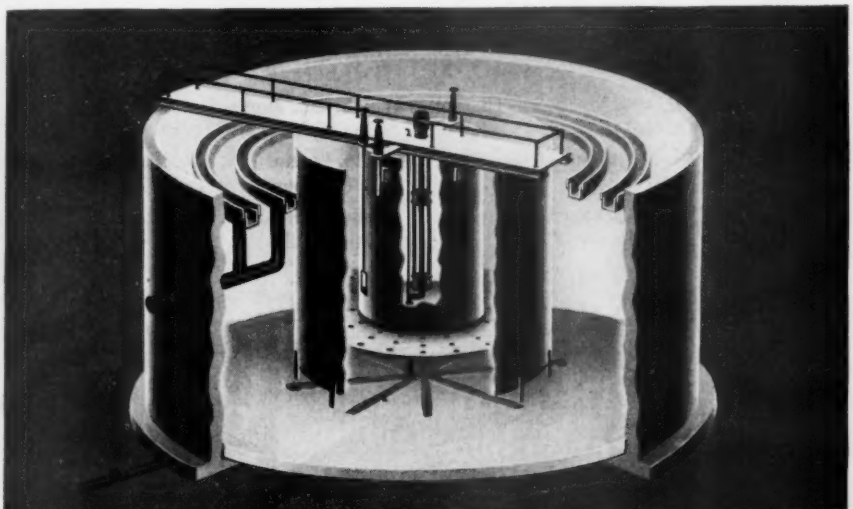

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(*Continued from page 42*)

McDonnell, Robert E., Burns & McDonnell Eng. Co., c/o Country Club P.O. Station, 108 W. 63rd St., Kansas City 2, Mo. (May '13) *MP*

Moore, Lee S., 35 Valley View Ct., New Albany, Ind. (Apr. '44)

Mortensen, F. C., Lt. Col., SnC, Station Hospital Lab., Fort Leavenworth, Kan. (Apr. '40)

New Mexico Public Service Co., Las Vegas Div., Las Vegas, N.M. (Corp. M. May '09)

Olson, W. M., Chem. Control Engr., Bureau of Eng., Chicago 49, Ill. (Apr. '26) *P*

Purcell, Lee T., Cons. Engr., 1 Lee Pl., Paterson 1, N.J. (Jan. '31)

Redmond, John, Jr., Capt., Headquarters 1st Medical Battalion, APO 1, c/o Postmaster, New York, N.Y. (Oct. '46)

Revelle, J. E., 2034 Sansom St., Philadelphia 3, Pa. (Apr. '40) *P*

Rice, William J., 2433 Angeles Ave., San Gabriel, Calif. (Oct. '44)

Roahrig, Henry L., P.A. Engr. (R), U.S. Public Health Service, 240 Peabody St., N.W., Washington, D.C. (July '43)

Robinson, Stephen B., Atty., 720 Rowan Bldg., 458 S. Spring St., Los Angeles 13, Calif. (July '46)

Roderick, R. E., 212 Rennie Bldg., Corvallis, Ore. (Apr. '46) *MP*

Rose, Thomas D., 499 North St., Chapel Hill, N.C. (Jan. '46) *P*

Ruth, Leo W., Box 563, Menlo Park, Calif. (Jan. '43) *P*

Sandquist, Emil, 2255 Grape St., Denver 7, Colo. (Jan. '27) *Director '33-'36.*

Smith, Chester A., Cons. Engr., Burns & McDonnell Eng. Co., c/o Country Club P.O. Station, 108 W. 63rd St., Kansas City 2, Mo. (Sept. '24) *P*

Stanback, Jeffrey F., Col., SnC, 1907 Alexander Rd., Raleigh, N.C. (Oct. '46)

Street, Haskell R., Chemist & Asst. Plant Supt., Water & Sewer Dept., 3821 Memphis St., El Paso, Tex. (Oct. '45)

Tanner, John R., c/o Holmes, O'Brien & Gere, Cons. Engrs., 204 E. Jefferson St., Syracuse 2, N.Y. (Oct. '39)

Tassie, Gilbert C., R.D. No. 2, Vernon, B.C., Can. (Oct. '38) *M*

Treanor, Earl E., 12 E. 16th St., Kansas City 5, Mo. (Jan. '44)

Turner, Marvin, Cons. Engr., Hoff & Turner, 818–819 Littlefield Bldg., Austin 15, Tex. (Oct. '40) *M*

U.S. Pipe & Foundry Co., D. B. Stokes, Vice-Pres., Burlington, N.J. (Assoc. M. June '92)

Van Brunt, J. K., Wallace & Tiernan Co., Inc., 1262 Commonwealth Ave., Boston, Mass. (July '38)

Wagner, Nelson J., Repr., The Gregg Co., Rusta Restor Div., 1946 Main St., E., Rochester 9, N.Y. (July '46)

Wall, Harold M., 1713 Missouri Ave., Houston, Tex. (Jan. '44) *M*

Watkins, William W., Gen. Delivery, Dillsburg, Pa. (June '22)

Westbrook, James A., Dist. Health Dept., Chapel Hill, N.C. (Oct. '43) *P*

White, Leonard P., San. Engr., 1523 Welch Ave., Houston 6, Tex. (July '43) *MP*

Williamson, L. A., 128 Hazel St., Chico, Calif. (July '38) *M*

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(*Continued from page 24*)

Leo Louis, who for the past five years was San. Engr. in charge of water supply work for the Indiana State Board of Health, has left that position to become City Engr. at Piqua, Ohio. In his new position he will also serve as consultant to the superintendents of the local water and sewage plants.

Samuel B. S. Nelson has been selected for the position of Engr. of Construction of the Los Angeles Dept. of Water Power to succeed Henry L. Jacques, retired. In assuming his new duties, Nelson will be in charge of construction of all dams, major pipelines, buildings, pumping and treatment plants, tunnels and other major projects, as well as inspection of the work of private contractors. Nelson joined the department staff in 1926 as a topographical draftsman; since 1932 he has been assistant to the head of the Field Eng. Div., with leave from 1942 to 1944 to head the department's Plant Protection Div. for the war emergency.

Chain Belt Co., Milwaukee, Wis., has announced production of a new line of self priming centrifugal pumps, press-formed of Armco ingot iron which is highly resistant to corrosion. One of the advantages claimed for the new design is a great saving in weight, which on the 2-in. size amounts to 90 lb. less than the former cast-iron construction. The new press-formed body resists cracking or shattering under heavy blows or in freezing weather and is usually easily repaired by welding.

Better performance and efficiency through a smoother flow of water over the even surface of the pump and press-formed volute have also been reported, and an improved method of priming is said to assure a faster prime. Complete details may be obtained by writing the company office at 1600 W. Bruce St., Milwaukee 4, Wis.

Mathieson Alkali Works, Inc., was awarded the government ammonia plant at Lake Charles, La., recently, signing a contract with the War Assets Administration which embodies a long-term lease with an option to purchase. The plant, which has been in stand-by condition since the fall of 1945, will require about four months of work before it is ready for operation. When ready, the operations of the plant will be integrated with the work performed at the company's Lake Charles alkali plant, built in 1934 to initiate the industrial development of the area.

Unlike other ammonia-producing units, the plant utilizes natural gas as its source of hydrogen and fuel; thus it is not dependent upon remote sources of materials such as coal. Research in ammonia and related products will be conducted at the plant, and it is contemplated that part of the research facilities will be established to facilitate studies of local materials, operations and markets.

(*Continued on page 48*)

PITTSBURGH • DES MOINES

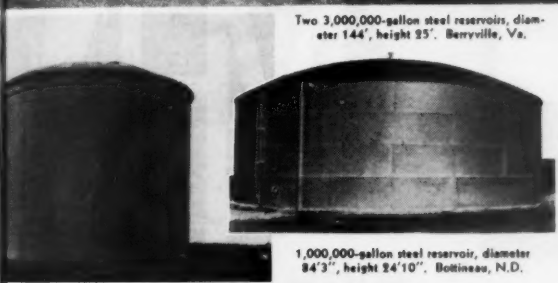
Steel Reservoirs

2,500,000-gallon steel reservoir, with ellipsoidal roof and ornamental pilasters. Diameter 80', height to roof 51'. Midland, Tex.

- **STRONG**
- **PERMANENT**
- **LOW IN COST**

for economical water storage!

Two 3,000,000-gallon steel reservoirs, diameter 144', height 25'. Berryville, Va.



1,000,000-gallon steel reservoir, diameter 84'3", height 24'10". Bottineau, N.D.

1,500,000-gallon steel reservoir, with ornamental cornice. Capitol Heights, Md.

...00-gallon steel reservoir, ellipsoidal roof; ...ter 48', height 25'. Fort Benton, Mont.

Two 100,000-gallon steel reservoirs, cone roof, diameter 30', height 21'. Atlantic, Iowa

Steel — with its strength, permanence and low maintenance — offers the best service and greatest overall economy in water reservoir construction.

Steel Reservoirs by Pittsburgh-Des Moines provide these advantages fully — plus the design engineering experience, modern fabrication, expert erection and guaranteed satisfaction typical of this responsible organization. *Write for a quotation on your projected reservoir requirements, of any type or size!*

PITTSBURGH•DES MOINES STEEL CO.

PITTSBURGH, PA., 3424 NEVILLE ISLAND—DES MOINES, IOWA, 925 TUTTLE STREET
NEW YORK, ROOM 921, 270 BROADWAY • CHICAGO, 1228 FIRST NATIONAL BANK BUILDING
DALLAS, 1229 PRAETORIAN BUILDING • SAN FRANCISCO, 631 RIALTO BUILDING
SEATTLE, 532 FIRST AVENUE SOUTH

(*Continued from page 46*)

Neptune Meter Co., New York, has appointed Edwin D. Capron, recently released from the Army Corps of Engrs. after 21 months overseas, to its sales staff. Capron will represent the company in the states of Arkansas and Louisiana.

The Rockwell Mfg. Co., Pittsburgh, Board of Directors has announced the election of W. F. Rockwell Jr. to succeed his father as president of the company. In retiring from that position, the senior Rockwell will retain the office of chairman of the board.

Hydrauger Corp., Ltd., San Francisco, has announced a new horizontal earth-boring tool, light enough to be operated by one man. Expressly developed for running in pipe leads, it is reported to be consistently straight-boring for underground distances up to 50 ft. Power is provided by a 3.2-hp. motor operated by 90-psi. air pressure. The pilot bit hole of 2-in. diameter can be opened up by reaming to 3½ and 4½ in. For added ease in handling, boring bar sections are only 2 ft. long and weigh but 5 lb. each. Further details on the new model (LHH–2) may be obtained direct from the company office at 116 New Montgomery St., San Francisco.

(*Continued on page 52*)

No caulking . . . no need to dig large bell holes . . . . large savings

Haymanite

THE PERMANENT, SELF-SEALING JOINTING COMPOUND FOR BELL AND SPIGOT CAST IRON WATER MAINS

FREE ILLUSTRATED BULLETIN

Explains: how Haymanite reduces labor and material costs; how any workman can make permanently tight joints; how fewer tools are needed; how leaks are reduced; why vibration is no threat.

Producers also of M. H. Brand Caulking Lead

MICHAEL HAYMAN & CO., INCORPORATED

ESTABLISHED 1869

862 East Ferry St. Buffalo 11, N. Y.

M H

HIGH QUALITY VALVES HYDRANTS

M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

HIGH HEAD LOSS
●
EXCESSIVE WASH WATER VOLUME
●
SHORT FILTER RUNS

HIGH MAINTENANCE COSTS
●
STRAINER CLOGGING

All troubles caused by graded gravel disappear on installing the ALOXITE aluminum oxide porous plate underdrain system in rapid sand filters.

Dispensing with graded gravel, displacement is no longer a problem. Mud balls are eliminated. Backwashing is uniform over the entire bed. Less wash water is required to maintain clean filter media. Longer filter runs are frequently obtained.

Added to these benefits is lower filtering and backwashing operating heads. They result from smaller pressure loss through the underdrain system and reduced filter heights.

More complete data are provided in Engineering Bulletin No. 2. For a copy, write Department P-47, The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

Underdrain Plates

BY CARBORUNDUM

TRADE MARK

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company

(*Continued from page 48*)

Maurice Brunstein was recently appointed Supt. & Engr. of the Atlantic City, N.J., Water Dept. to fill the post left vacant by the death of Lincoln Van Gilder last November. Brunstein has been with the department for a number of years, first as Chem. Engr. and then as Van Gilder's assistant.

Vance A. Sichler recently resigned his position as water superintendent for the Hercules Powder Co. to become Sales Engr. for the W. H. & L. D. Betz Co. El Paso, Tex., office. Sichler had been associated with the Hercules Powder Co. for the past five years, first at the Badger Ordnance Works and later at the Missouri Ordnance Works.

Carlos S. de Santamaria, who became a member of the A.W.W.A. in 1935 when he was a sanitary and civil engineer in his home city of Bogotá Colombia, recently left Washington, where he had served as Colombian Ambassador to the U.S., to assume his new duties as his country's Minister of War.

Nox-Weed, a herbicidal material containing sodium tetraborate decahydrate and sodium chlorate as active ingredients, has been marketed for a number of years now as a weed killer and ground sterilant. Although the water works field has been more than willing to accept with composure claims that the product is an efficient killer of such infestations as thistles, sunflowers, tobacco weed, mustard, devil grass and Johnson grass, it is more than startling to learn that it—or that any product for that matter—can effectively control or eliminate wild oats, which we have always considered more of an urge than a weed. Further details may be obtained from George Z. Harman, 5757 Alcoa Ave., Los Angeles.

Wallace & Tiernan Co., Inc., Belleville, N.J., recently placed on the market a "pocket size" filter plant for the use of sportsmen, travelers, construction crews and other small groups to whom approved public water supplies are unavailable. Originally developed during the war for the use of the armed forces, the "Mini-Filter" was used successfully all over the world. It includes a hand pump and filter together with a purifying kit ("Aqua-Tabs") all in a pocket size unit weighing less than 5 lb. The principle of operation is the same as that used by full-scale filter and treatment plants.

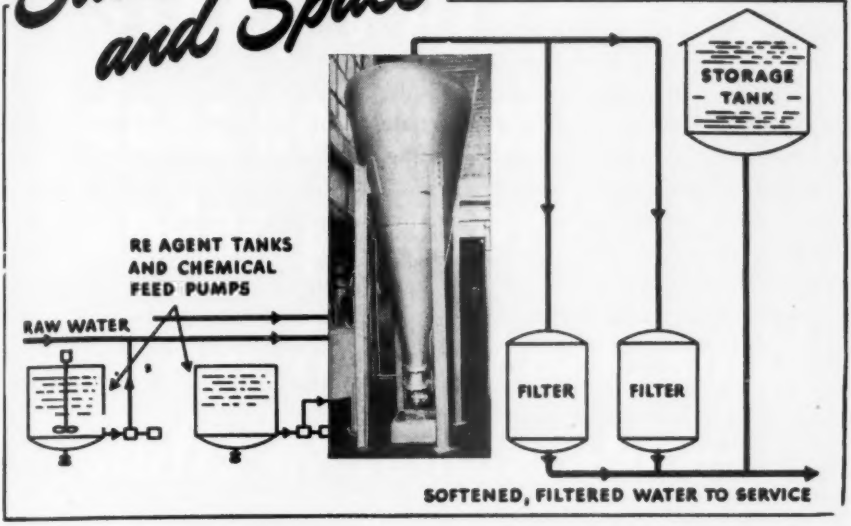
The "Aqua-Tabs" kit included in the unit contains chemicals for purifying, testing and removing the "chemical" taste from water. It will also be marketed separately for treatment of waters which require no filtration.

Marketing of both these units, at least initially, will be through sporting goods dealers.

(*Continued on page 54*)

NEW SLUDGELESS WATER SOFTENER...

Saves time and Space



Permutit* Spiractor applies established principles in a new way

Permutit's Spiractor—latest addition to modern cold lime or lime soda water treatment—operates on the principle of intimate contact with solid nuclei for accelerated precipitation. The conical container—itself a great saving in space over other type systems—is more than half filled with fine granules of calcium carbonate catalyst. Hard water and lime soda precipitant enter at bottom, mix at once, flow upward through catalyst bed. This tangential inflow gives a rising swirling motion that greatly speeds softening reaction by affording immediate contact between chemically treated water and suspended granules.

Precipitated hardness deposits on the surface of these granules which increase in size. There is no watery sludge; the enlarged granules are readily disposed of like moist sand grains. Detention period of the Spiractor is only five to ten minutes.

For more information write the Permutit Company, Dept. JA4, 330 West 42nd St., New York 18, N. Y. or Permutit Co, of Canada, Ltd., Montreal.

* Trademark Reg. U. S. Pat. Off.

PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 52*)

Electric Machinery Mfg. Co., Minneapolis, has issued an interesting die-cut four-page folder in three colors, showing cutaway views and details of construction of the new E-M "Heavy-Duty" squirrel-cage induction motors designed for drip- and splash-proof construction in large-power ratings from 100 to 1,000 hp., 1,800 rpm. and lower. The bulletin may be obtained by requesting Publication No. 188 direct from the company.

Builders-Providence, Inc., Providence, R.I., has announced a new electrically operated secondary instrument for use with its mechanical flowmeters or as a recording-indicating-totalizing tachometer. The instrument is actuated by impulses over a two-wire circuit from a transmitter which is mechanically driven by the primary meter. No power supply is necessary for the primary instrument. The transmitter consists of a switch which makes contact for a predetermined number of gallons as they pass through the meter. The instrument provides readings of total flow, rate of flow and a chart record of flow over any distance from a few feet to many miles from the primary instrument. Complete details are available from the manufacturer.

(*Continued on page 56*)

Prevent Rusting

Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.

If your tanks and steel structures are not now protected by this proven low cost method, they should be. No obligation. Send for fully descriptive literature today.

RUSTA RESTOR
Division of
THE JOHNSTON & JENNINGS CO.
862 Addison Road, Cleveland 14, Ohio

Vogt

Fire Hydrants

Standard—"Traffic Model"—Flush Type—Water Crane Type

Vogt

Gate Valves

Non-Rising Stem—Outside Screw and Yoke—Hub End—Flanged End—Ends to Fit Any Type Pipe

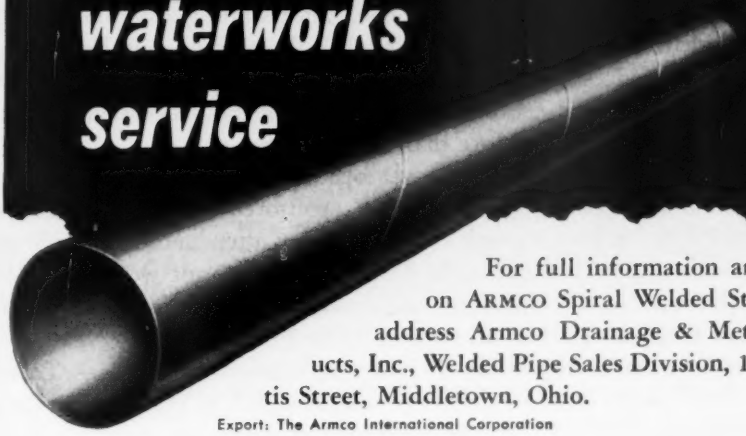
Also—Floor Stands, Shear Gates—Tapping Sleeves and Valves—Flap Valves—Mud Valves

Vogt

Brothers Mfg. Co., Inc.
Main at 14th Street, Louisville 3, Ky.

THIS STEEL WATER PIPE does not crack under pressure*

...nor from shock, soil shifts or temperature changes in normal waterworks service



For full information and prices on ARMCO Spiral Welded Steel Pipe, address Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1495 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation

*Ultimate strength, 50,000-60,000 psi.; yield strength, 30,000-40,000 psi.; elongation in 2 inches, 30%.

ARMCO

ARMCO STEEL PIPE

(*Continued from page 54*)

NORTH CAROLINA SECTION MEETING

The North Carolina Section held its annual joint meeting with the North Carolina Sewage Works Association at the Carolina Hotel, Raleigh, November 18–20, 1946. A total of 237 members and guests attended.

The meeting was called to order by L. I. Lassiter, Section Chairman, after which the delegates were welcomed to Raleigh by Mayor Graham H. Andrews, whose address emphasized the importance not only of a pure and adequate water supply but of a well managed and operated water works plant and system.

Opening the technical program, E. D. Burchard, U.S. Geological Survey, Raleigh, spoke on the subject "Twenty Years of Stream Flow Measurement in North Carolina." Following discussion from the floor, Grover H. Jones, City Atty., High Point, led a panel on the legal responsibilities of municipal water and sewage departments, which evoked comment from practically all members in attendance.

The afternoon session was introduced by a movie, "Clean Waters," presented by the General Electric Co., following which the members divided into two groups to participate in round table discussions. The first group, presided over by J. A. English, discussed management problems; and the second, led by R. W. Luther, covered the problems of plant operation.

Following the business meeting on the morning of the second day, L. L. Hedgepeth, Exec. Secy. of the Virginia Water Control Board, presented a paper on "Use, Not Abuse, of Streams," in which he described a possible approach to the abatement of industrial stream pollution.

At the honorary luncheon for national officers and guests, both A.W.W.A. President Wendell R. LaDue and F.S.W.A. President Francis S. Friel presented addresses. LaDue spoke on "The Personnel Equation in Water Works" and Friel, on "Aims and Objects of the Federation of Sewage Works Associations." More than 200 were present.

The technical session following was opened with a motion picture on "Construction and Coating of Steel Pipe," sponsored by Armco Drainage and Metal Products, Inc., Raleigh. Then those in attendance again split up in two groups to join in round table discussions on sewage works. C. W. Mengel, Raleigh, led the discussion on "System Maintenance" and W. M. Franklin of Charlotte guided the panel on "Plant Operation."

At the Annual Banquet, T. S. Johnson, Raleigh, presided as Toastmaster. The Maffitt Membership Cup was presented to Max D. Saunders of Chapel Hill for having obtained most new members for the A.W.W.A. during the year. Next, the George Warren Fuller Award was presented to McKean Maffitt of Wilmington for his almost thirty years of service to his community and his untiring efforts on behalf of the North Carolina Section from the time of its establishment. Following presentation of the awards,

(*Continued on page 58*)

The economics of corrosion-proof pipelines

REQUIRE **Stability of protective coating**

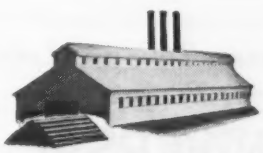
Modern application and electrical inspection

Cathodic protection

The effectiveness of the electrical insulating properties of Barrett Coal-tar Enamels is not changed by varying moisture content of the soil during changes in weather, season or time itself—factors which are necessary to make cathodic protection effective and economical.

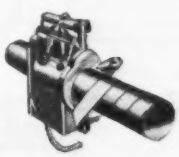
Over the years, uniformly satisfactory results have been obtained when Barrett Coal-tar Enamels have been applied by modern methods, and electrically inspected, to insure continuity of the electrical insulation.

Protection applied in transit



Modern equipment for the proper application of primers and enamels over mechanically cleaned pipe is available at numerous application contractors' plants, which apply Barrett protective coating systems while the pipe is in transit to your destinations.

Protection applied in the field



Thousands upon thousands of miles of pipelines have been protected with Barrett primers, enamels and asbestos felts, application being made over the ditch with modern traveling coating equipment and with increased efficiency and low costs.

Either way, the combination of proved coating materials and proved application methods will assure the economy of your investment in cathodic protection.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N.Y.

FIELD SERVICE: The Barrett Pipeline Service Department and staff of Field Service men are equipped to provide both technical and on-the-job assistance in the use of Barrett Enamel.

Barrett
COAL-TAR ENAMEL
Reg. U. S. Pat. Off.

(*Continued from page 56*)

R. B. House, Chancellor, Univ. of North Carolina, entertained the assemblage with a most interesting and humorous address.

The last session of the meeting opened with a movie entitled "Concrete Facts," presented by the Master Builders Co., Cleveland, Ohio. Everett M. Jones, Simplex Valve & Meter Div., Philadelphia, then discussed the material supply situation, presenting a gloomy picture for the near future. Final paper was one by A. M. Boehm, Engr., Worthington Pump & Machinery Corp., who spoke on "The Utilization of Sludge Gas for Power."

G. S. MOORE
Secretary-Treasurer

Liquid Conditioning Corp., Linden, N. J., recently announced the appointment of Engineering Sales Corp. of Boston, Mass., as its New England representatives for the sale of water conditioning equipment and materials. The new sales organization, under the presidency of Fred S. Gibbs, afford the company the benefit of long experience in engineering and sales work throughout the New England states.

(*Continued on page 60*)

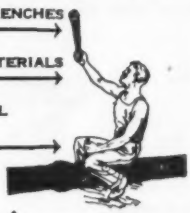
3 *Money, Time and Labor Saving Features of*

UNIVERSAL CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.



For water supply, fire protection systems, sewage disposal systems, industrial, and irrigation. Flexible.

Dept. C
THE CENTRAL FOUNDRY COMPANY
386 FOURTH AVENUE, NEW YORK 16, N. Y.

Gentlemen: Send us information and catalog on UNIVERSAL CAST IRON PIPE.

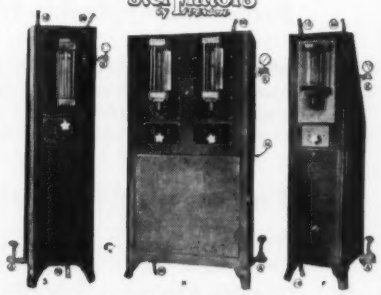
NAME_____

STREET_____

CITY_____

FEEDS — METERS — MIXES CHLORINE GAS ACCURATELY

SterElators by Everson



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

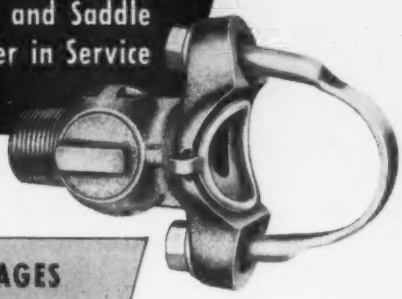
SterElators by Everson

EVERSON MANUFACTURING COMPANY
221 West Huron Street, Chicago 10, Illinois

It's New . . .

HAYS "DUO-STOP"

A Combination Corporation Stop and Saddle
That's Simpler to Apply, Stronger in Service



PATENT APPLIED FOR

NINE IMPORTANT ADVANTAGES of the New HAYS "DUO-STOP" and Pipe Saddle

- The new Hays "Duo-Stop" makes possible a quick, simple, and safe installation of corporation stops on small mains of 2" size, where the small diameter and the thin wall make it impractical to tap the main.
- The "Duo-Stop" is strapped securely and permanently to the main, the stop is opened, and the hole is drilled, by a drilling machine inserting the drill through the stop.
- The installation may be made while the main is under water pressure - - Thus no shutdown of service.
- There is no threaded connection in the Pipe Saddle Shut-Off; stop and service clamp are one piece, solid rust-proof bronze, pressure tight and leakless.
- The extra strength, secured by one-piece construction and reinforced ribbed design, prevents distortion due to strain of strapping, or of outside stresses, and assures perfect functioning.
- The lead gasket provides a tolerance that guarantees a tight fit on either cast iron or steel service mains.
- The 2" "Duo-Stop" Saddle is designed for use on either 2" cast iron or steel pipe. The 2¼" "Duo-Stop" Saddle is designed for use on either 2¼" cast iron or 2½" steel pipe.
- The fact that service clamp and stop are cast in one piece simplifies purchasing and stock-keeping. Eliminates necessity of purchasing as separate items.
- Outlets for all types of services.

Write for Folder 105

HAYS
COPPER · BRASS · LEAD · IRON
WATER WORKS PRODUCTS
HAYS MANUFACTURING CO., ERIE, PA.

(*Continued from page 58*)

INDIANA DISTRICT WATER WORKS MEETINGS

An excellent example of the successful use of the regional meeting is afforded by the 12th Annual District Meetings for Water Works Operators, sponsored jointly by the A.W.W.A. Indiana Section, the Indiana State Board of Health and Purdue University. Five meetings were held during September 1946—one in each of the five new branch areas of the State Board of Health (for explanation, *see* September 1946 JOURNAL, p. 1046).

Although the attendance of 333, and the number of water works represented—107, or 31 per cent of the total—did not approach the 1945 records, the results were certainly satisfactory and in line with the totals for previous years. A new record for attendance was posted in one area—116 persons from 31 water works, representing 37 per cent of the systems in the area, registered at the Northwest Meeting at Rochester.

At the Northeast Meeting at Auburn, attendance was 58 persons from 18 water works—19 per cent coverage for the area. The Southwest Meeting at Jasper and the Southeast Meeting at Greensburg were tied with attendance records of 59 each, from 20 local water works—34 per cent of those in each area. The highest percentage of water works represented was at the West Central Meeting at Spencer, where 41 executives from 18 water works represented 44 per cent of the plants in the area.

A general program suggested by the Water Works Meetings Committee served as the basis for each sectional program. The pattern followed included a welcome by the mayor of the host city, an opening address by Thomas J. Burrin, Chairman of the Indiana Section, and the presentation of papers of interest to all attending.

An informative paper on "Meter Testing at Low Flows" was delivered by John L. Ford of the Ford Meter Box Co., Wabash, who discussed the importance of testing for accuracy at minimum flows. The general subject of "Experiences in Water Supply Overseas" was capably presented by John Stock, San. Engr., State Board of Health, at Rochester; by Max Barrett, San. Engr., State Board of Health, and O. M. Leonard, Chief Engr., Boyd Phelps, Inc., at Auburn; by A. L. Klatte and Harold S. Griswold, San. Engrs., State Board of Health, at Spencer and at Jasper; and by W. F. Uhl, San. Engr., State Board of Health, at Greensburg. Each of these men had experience in either the European or Pacific Theaters while in the Navy or the Sanitary Corps of the Army.

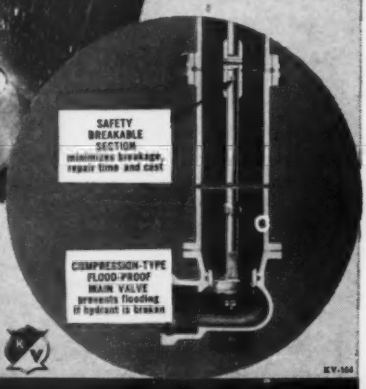
A paper on the "Progress of the Indiana Ground Water Survey," prepared by Fred H. Klaer, Geologist, U.S. Geological Survey, Indianapolis, was presented by the author at the Rochester, Auburn and Greensburg Meetings; and by Robert Stallman and Edwin Brown, also of the U.S. G.S., at the Jasper and Spencer Meetings, respectively. The motion picture, "Installing Cast-Iron Pipe," produced by the Cast Iron Pipe Research

(*Continued on page 62*)

A NEWS PICTURE THAT NEVER SHOULD HAVE HAPPENED . . .

. . . It never would have happened if the hydrant were a Safetop.

This news-photo appeared recently in a leading picture magazine. A smashed hydrant . . . a 100-foot geyser which short-circuited high-tension wires overhead . . . a crackling cascade of electrically charged water . .


SAFETY BREAKABLE SECTION
minimizes breakage, repair time and cost
COMPRESSION-TYPE FLOOD-PROOF MAIN VALVE
prevents flooding if hydrant is broken

When a Kennedy Safetop is involved in such an accident the major parts are undamaged. The main valve remains closed . . . no geyser or flood . . . no need to shut off water service while awaiting or making repairs. One man can complete the repair within a half hour, at a cost of only $6.00 for repair parts. . . . For greater community safety install Kennedy Safetops. Write for detailed information today.

THE KENNEDY VALVE MFG. CO. • Elmira, New York

KV-166

KENNEDY *Safetop* HYDRANT

(*Continued from page 60*)

Assn., was presented at all District Meetings for the benefit of those who had missed the earlier showings.

The story behind the "Proposed Regulations Governing Certification of Water Plant Operators in Indiana" was told by B. A. Poole and Leo Louis of the Bureau of San. Eng., State Board of Health. Attempts to procure licensing legislation and inclusion of a certification regulation in the Rules and Regulations of the State Board of Health have led to a proposed amendment to the regulations outlining the procedure for issuing certificates. Comments and criticism from the audience were requested, and lively discussions of the subject resulted at most of the meetings. Very little adverse criticism was voiced, however, and, in general, the water works operators seemed satisfied with the proposed regulations.

The timely subject of "The Need for a Professional Engineer in Designing Water Works Improvements" was discussed by Profs. Ralph B. Wiley, Warren E. Howland and Don E. Bloodgood of the School of Civ. Eng., Purdue Univ. The economies and advantages of master planning of projects, together with the necessity of considering past experiences in other communities, were strongly emphasized.

After the noon luncheons, the John N. Hurty Service Awards were presented to those men whose completion of 25 years of water works service qualified them for the award during 1946. The awards were presented by Dr. L. E. Burney, B. A. Poole, Joseph L. Quinn and Leo Louis at the different meetings.

Much of the credit for the success of the meetings is due all of the local chairmen who arranged the sessions and the noon meals. The Indiana Section Committee in charge of general arrangements for the meetings included W. F. Conrad, Bicknell; Harry J. Draves, Michigan City; Max Stearns, Kokomo; Prof. Warren E. Howland, West Lafayette; Charles Scholl, New Castle; Ted McCoy, Brazil; and Leo Louis, Indianapolis.

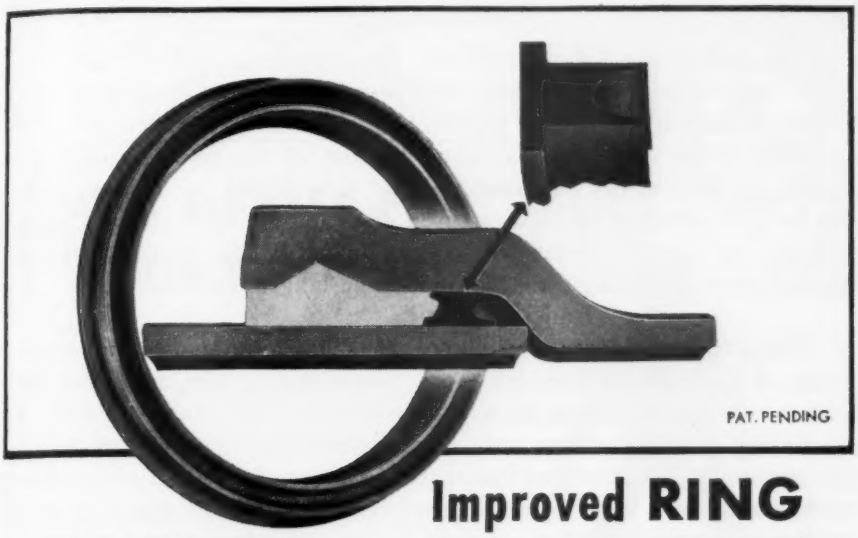
LEO LOUIS, *Chairman*
Water Works Meetings Committee

(*Continued on page 64*)

ZECO GREENSAND ZEOLITE

ZECO and HI-ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.
90 WEST STREET NEW YORK 6, N. Y.



Improved RING PACKING... assures pouring of dry joints...

The Smith-Blair Water-Lock Ring does a real job of packing a bell and spigot cast-iron pipe joint! It is self-locking; it is self-adjusting to oversize bells; its sealing action automatically increases when pressure exists in the line. Made of molded rubber, it is non-porous and cannot be a culture-point for bacteria or any other contaminating element. It is installed quickly by simply rolling it back over the spigot. There is no cutting, fitting or chances for oversight; and its use actually saves on installation time. It is the only sealing ring hydrostatically designed to increase its sealing action automatically from pressure in the line. Effectively dams off water and assures pouring of dry joints.

Hydrostatically designed to hold 40-60 lb. pressure without compound.

Immediate Delivery!

SMITH-BLAIR WATER-LOCK RING PRICES					
Size	500 or more (each)	100-499	50-99	1-49	Approx. Shipping Wt. per 100 rings
4"	18¢	20¢	21¢	24¢	25 lbs.
6"	22¢	23¢	24¢	26¢	35 lbs.
8"	25¢	26¢	27¢	30¢	45 lbs.
10"	31¢	32¢	33¢	35¢	55 lbs.
12"	37¢	38¢	39¢	41¢	65 lbs.

Packed 50 rings to a carton. Broken cartons take the 1 to 49 price shown above. Quantity prices based on full cartons.

Used with any joint compound. Saves time. Makes a better joint.

Stocked in principal cities. Write for name of your nearest Smith-Blair Distributor.

SMITH
Water works supplies and specialties
BLAIR
INC.

SOUTH SAN FRANCISCO • CALIFORNIA

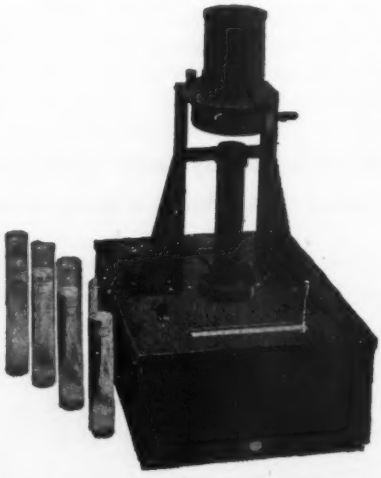
ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

(*Continued from page 62*)

The Smith-Blair Co. of South San Francisco, Calif., offers a flexible tee coupling which it claims will permit simple and economical connection of laterals to existing pipelines by eliminating the need for field threading in the trench and avoiding the use of the flexible couplings, nipples, tees and unions customarily used. The flexible tee is now available for 2-in. standard and od. cast-iron pipe, and for other sizes as small as ¾-in. In each, the outlet is the same nominal size as the pipe, but has standard threads which permit the use of a bushing where needed.

Proportioneers, Inc., Providence, R.I., have announced the availability of a new water filter called the "Pur-O-Cel." The unit, designed for use in small treatment plans and swimming pools, makes filtering a simple mechanical operation, requiring no skilled operators. Perfected in war service, the filter utilizes thin mats of diatomaceous earth rather than sand as a medium. Due to its compactness and rapid filtration rate, it is much smaller than sand filters of equal capacity, thereby saving floor space. Backwashing for cleaning is easily accomplished without disassembling and with a comparatively small volume of water. Complete details are given in Company Bulletin 1550.

(*Continued on page 66*)



LUMETRON

Photoelectric Colorimeter Mod. 450 for Nessler Tubes

A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

- Turbidity tests in terms of APHA (ppm) scale.
- Color tests in terms of APHA (mg Pt) scale.
- Suited for determination of ammonia nitrogen, nitrate, nitrite, and for all other colorimetric tests according to APHA "Standard Methods."

Operates with all "low-form" Nessler tubes 32 mm O.D., 200 mm high. Requires no matched sets of tubes.

LUMETRON Mod. 450 eliminates the uncertainties of visual matching methods. It requires no permanent color standards and furnishes reproducible results independent of individual judgment and of light conditions.

Write for literature to

PHOTOVOLT CORP.

95 Madison Ave. New York 16, N. Y.

GENUINE BITUMASTIC CARRIES THIS SEAL

K KOPPERS

GIVE LIGHTER PIPE
THIS BUILD-UP

TAKE PIPE WITH 3/16" WALL
ADD A THICK SEAMLESS COAT
OF BITUMASTIC ENAMEL HERE

AND A SPUN LINING OF
BITUMASTIC
ENAMEL
HERE

TODAY'S PRICES dictate the use of lighter pipe. The additional service that can be built into such pipe through the use of genuine Bitumastic enamels properly applied, makes that choice feasible and economical.

Bitumastic enamels can make lighter pipe last longer at a lower first cost. You will also have the matchless protection against corrosion from without and tuberculation from within that is the basis for the reputation of Bitumastic the world over.

Cross section of 30" pipe with 3/16" wall—showing actual thickness of Bitumastic coatings.

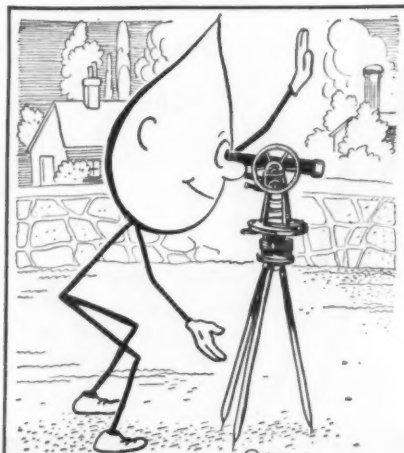
WAILES DOVE-HERMISTON CORPORATION
WESTFIELD, NEW JERSEY
A SUBSIDIARY OF KOPPERS COMPANY, INC.

New York 4 • Philadelphia 8 • Cleveland 14 • Chicago 3 • Houston 2
Tulsa 3 • Miami 36 • San Francisco 10 • Los Angeles 1

(*Continued from page 64*)

Cooper-Bessemer Corp. of Mount Vernon, Ohio, and Grove City, Pa., manufacturers of diesels, gas engines and compressors, recently announced a firm price policy both in connection with sales of all its products for delivery during the year and for purchase of component materials and parts. Suppliers have been requested to co-operate in the policy, and preference has been promised those who do. This second announcement in as many months seems to signalize a general effort on the part of heavy industry in the field to stabilize equipment prices at their present level.

Columbia Chemical Div., Pittsburgh Plate Glass Co., recently issued an elaborate 72-page text designed for use by technical men, buyers and executives interested in the economics of caustic soda; by the operations man interested in procedures for unloading, handling and storing the chemical; by the engineer who must design equipment; and by the student who desires useful data on the characteristics, uses, forms, transportation and constants of the material. The book contains many useful illustrations, both drawings and photographs. Copies may be obtained by writing on your company letterhead to the division office at 5th Ave. at Bellefield, Pittsburgh 13, Pa., requesting Form A–100.



Mapping out a Public Relations Campaign?

Let Willing Water help you . . . he's the master of all he surveys. Let him clear the brush of public ignorance of water works problems. Let him erect for you an edifice of public appreciation and co-operation on a foundation of good will.

Willing Water is waiting to meet your customers and employees. Right now he has 32 different approaches to your problems in the form of low-cost blocked electrotypes or newspaper mats. And he's only beginning his career. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
500 Fifth Avenue · New York 18, New York

NEWS OF THE FIELD

Many of the controls promulgated by the Civilian Production Administration lapsed at the end of March 1947. Now, in the most serious fashion, water works men must be advised to return to their prewar practice of relying on themselves and the manufacturers of construction and maintenance materials for solution of their problems.

We have all known that wartime controls would eventually be terminated. Generally speaking, manufacturers feel that they can work out their production problems better if the normal trade channels are allowed to re-establish themselves.

A review of current conditions appears to indicate that manufacturers' delivery schedules are in the main no better and no worse than they were a year ago. There may be small comfort in that, but the limitations upon major construction, derived from the inflationary conditions in the building material and labor fields, have resulted in the reduction of many water works programs to the bare necessities of supporting the housing drive and carrying on essential maintenance and repair of existing structures.

The water supply field, insofar as it is unable to make satisfactory progress without aid from Washington, will now have to rely principally upon the National Housing Administration for assistance. Mr. Arthur Gorman is Director, Land and Public Utilities Advisory Service of the NHA. His office is located in Temporary Building "E," Room 7204. In great emergency he may be reached by telephone via Republic 7500, Extension 3437.

The new Journal Style Manual, which appears on pages 473–488 of this issue, is required reading—and required heeding—for all A.W.W.A. authors and orators. Not only will close conformance with the rules and suggestions set forth therein assist the prospective writer or speaker in preparing his material and the editor in working with it, but it will pay dividends in reader and listener attention and understanding.

In developing these standards for manuscript preparation, publication procedures and oral presentation, the JOURNAL staff has attempted to give writers and speakers a concise, usable guide to the proper presentation of technical subjects. To assure its availability, it is proposed to distribute copies to all scheduled speakers on section meeting or convention programs. Reprints of the document will also be available from A.W.W.A. headquarters by the first week in July.

(*Continued on page 2*)

(*Continued from page 1*)

The Institute of Water Engineers of Great Britain approximately a year ago established a Research Co-ordinating Committee to initiate investigations into various aspects of water supply. The Committee, a body somewhat analogous to the A.W.W.A. Water Works Practice Committee, is under the direction of N. J. Pugh, Corp. Water Engr., Coventry. Current topics under examination are: (1) the use of supersonic frequencies in the protection of reservoirs and in water treatment; (2) the recognition, anticipation and inhibition of algal growths; (3) the sterilization of water; (4) the corrosion and failure of pipelines; (5) the application of modern statistical methods to rainfall runoff, the yield of supplies and other hydrological problems affecting water supplies; (6) the evaluation of construction materials used for water works fittings—especially hot-pressed and cast fittings; (7) the mechanics of filtration; and (8) the standardization of methods of chemical analysis.

Panels of Institute members interested in the various subjects have been organized, and co-operation is expected from universities and manufacturers. Progress in the various fields was reported in the first issue (Feb. 1947) of the bimonthly *Journal of the Institute of Water Engineers,* which became the official publication of the Institute, with the termination of its published *Transactions.*

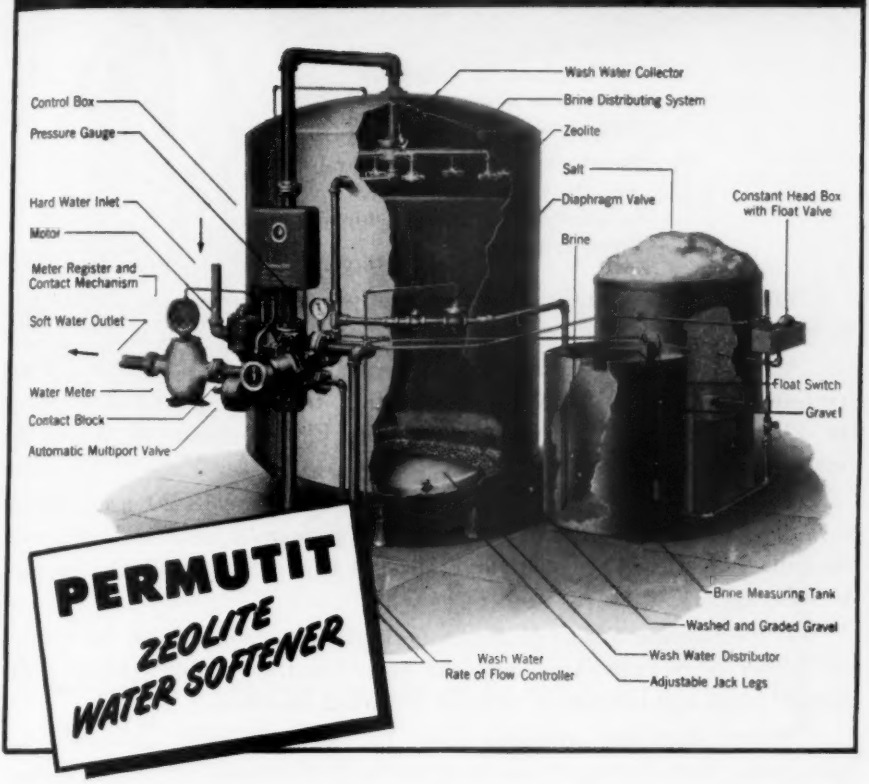
The weather blitz that put all Britain on an emergency basis again before it had fully recovered from the shocks of the war recently alerted the London water works emergency squads when flash floods resulting from a quick thaw inundated thousands of acres of that city's watershed. Emergency "boil water" warnings were broadcast by radio to the million Londoners whose supplies were affected, and tank trucks of pure water were despatched to the areas involved. Unprecedented snowstorms, subzero weather and hurricane winds, together with the accompanying fuel shortage, have kept all public utility personnel on wartime blitz schedules.

Simultaneously, a heavy snowfall throughout the major portion of New York State in early March occasioned a State Department of Health warning to all water supply officials, alerting them to the dangers of pollution which would attend a quick thaw and heavy rain. The Department's Division of Sanitation promptly issued instructions for emergency chlorination procedures to be invoked and made recommendations for the protection of structures exposed to flood action. Emergency mobile equipment was readied for use.

Although no critical situation resulted in the latter case, both instances illustrate well the application of war-learned techniques to peacetime emergencies. Both argue strongly for the continuance of the mutual aid programs and other emergency organization and facilities established during the war.

(*Continued on page 4*)

Completely Automatic-



THE zeolite process—originated by Permutit—is the *simplest method* for removing hardness from water. Original cost of equipment is lower than that of any other form of water softening. And in Permutit's *completely automatic* zeolite softener, the process reaches its highest efficiency. In a Permutit* automatic zeolite unit—simple and compact—the water is softened under positive electrical control... with a minimum of attention, a minimum of manpower. Backwashing, regeneration and return to service are all automatic. Process is particularly adaptable to well waters.

Thousands of these units have been installed, not only in municipal service, but also in industry. Smaller units are available for private homes. Our staff will be glad to work with you and your consultants in selecting the best type of water treatment for your community. Write The Permutit Company, Dept. JA5, 330 West 42nd Street, New York 18, N. Y., or Permutit Co. of Canada, Ltd., Montreal.

* Trademark Reg. U. S. Pat. Off.

PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 2*)

Paleontological proof of the prehistoric need for water purification appeared in the February issue of the *Percolator,* publication of the New York Chemists Club, in the following terms:

The Ichthyosaurus lived of yore
On the plains of Timbuktu
Where the water was H_2SO_4
And the air was CO_2

But the water ran into a nitrate bed
And the Ichthyosaurus, he,
In spite of his hide, lay down and died
From drinking HNO_3.

Short school courses for water supply and sewerage personnel were recently announced by three universities:

At the *University of Florida,* Gainesville, June 9–14, a course will be sponsored by the A.W.W.A. Florida Section, the State Board of Health, the Florida Sewage Works Assn. and the Florida Assn. of Water & Sewage Plant Operators.

At *Louisiana State University,* Baton Rouge, June 18–20, a course is to be held under the joint auspices of the University's General Extension Div., the State Board of Health and the State Conference on Water Supply & Sewerage.

At the *Georgia School of Technology,* Atlanta, Sept. 17–19, the Georgia Water & Sewage Assn. and the State Dept. of Public Health will sponsor class and laboratory sessions for plant operators.

Water, love and smallpox were the factors which combined to jail a young New York girl who tried too hard to impress her man. Using water as her vaccine, she took advantage of the recent smallpox scare to leave her mark on some 50 willing patrons of two metropolitan restaurants before she scratched the unco-operative arm of the law.

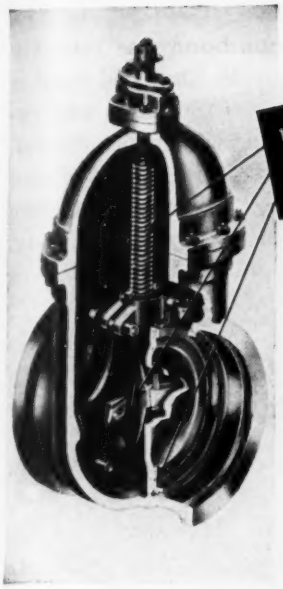
(*Continued on page 6*)

"Meet me at the Well"

In the Main Arena of the San Francisco Civic Auditorium

when A.W.W.A. and F.S.W.A. members turn out en masse to see what's new, talk shop, renew acquaintances, swap ideas at their joint annual conventions, from—

July 21 to July 25, 1947



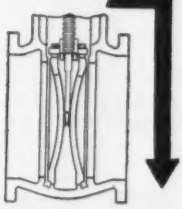
1. Continued turning of valve stem.
2. Brings wedges into action and expands the discs against their seats.
3. After disc travel ceases.

Why

SMITH GATE VALVES

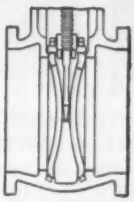
DO NOT WEDGE PREMATURELY

All the Way DOWN



and then

OUT



Because of its unique side wedging action, the discs of a Smith Gate Valve are not expanded laterally until *after* they have completed their travel and fully cover the ports. Termination of the discs' travel and further turning of the valve stem actuates the wedges and expands the discs. In opening, the action is reversed, the wedges are fully released before the discs commence to travel to an open position.

Smith Gate Valves are made in all types and sizes for manual, hydraulic cylinder, or motor operation and for low—medium—high pressure services.

18

FIRE HYDRANTS
GATE VALVES
CHECK VALVES
INSERTING VALVES
TAPPING SLEEVES AND VALVES
WATER SERVICE BRASS GOODS

THE A. P. SMITH MFG. CO.

EAST ORANGE NEW JERSEY

FLOOR STANDS
INDICATOR POSTS
TAPPING MACHINES
INSERTING MACHINES
PIPE CUTTING MACHINES
INCORPORATING TAPPING MACHINES

(*Continued from page 4*)

A new type of franchise water works revenue bond was recently issued by the city of Toledo, Ohio. The terms provide "that said bond is payable only out of the gross revenue of the water works system and extensions thereto after provision only for operation and maintenance thereof, and is secured only by a mortgage upon the property and revenues of said public utility and extensions thereto, which mortgage includes a franchise under which, in case of foreclosure, the purchaser may operate said utility. . . ." The franchise extends for a period of twenty years after date of sale of the utility upon foreclosure.

Three new ASA documents are now available for distribution: American Standard for Letter Symbols for Chemical Engineering Z10.12–1946, approved Sept. 26, 1946; American Standard for Steel Socket-Welding Fittings B16.11–1946, approved Dec. 9, 1946; and American Standard for Brass or Bronze Screwed Fittings 125 lb. B16.15–1947, approved Jan. 23, 1947. All three documents are obtainable from the American Society of Mechanical Engineers' office at 29 West 39th St., New York. Prices are 50¢, 60¢ and 65¢ respectively.

(*Continued on page 8*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

SterElators by Everson

PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

SterElators by Everson

EVERSON MANUFACTURING COMPANY
221 West Huron Street, Chicago 10, Illinois

M H

HIGH QUALITY VALVES HYDRANTS

M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

IN the construction of corrosion-proof pipelines, experienced engineers recognize the value of complete electrical inspection. It not only eliminates holidays and improves the quality of application and handling of the pipe, but also provides a dependable guide as to the continuing stability of the enamel insulation—determines whether or not cathodic protection will be economical over a long period of years.

These electrical inspections insure the superior insulation value of Barrett Coal-tar Enamels. Because of their high resistance to moisture absorption, these coatings possess the unvarying *stability* of dielectric strength that is required to make cathodic protection economical. They make it possible to use a minimum number of cathodic units and a minimum application of complementary electrical energy — factors which are all-important in the design of corrosion-proof lines.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

FIELD SERVICE: The Barrett Pipeline Service Department and staff of Field Service men are equipped to provide both technical and on-the-job assistance in the use of Barrett Enamel.

Barrett
COAL-TAR ENAMEL
Reg. U. S. Pat. Off.

(*Continued from page 6*)

The Detroit Department of Water Supply will be host to hundreds of Michigan safety experts in attendance at the annual Michigan Safety Conference convening in that city on May 20. A conducted tour through the department's properties, as well as through the Department of Public Works, the Overhead Lines Despatching Board and the plants of the Detroit Edison Co., Michigan Bell Telephone Co. and Michigan Consolidated Gas Co., has been scheduled as part of the program for the public utilities division of the conference.

The Maryland General Assembly has been asked to take legislative action on two bills creating rural water areas of the Washington Suburban Sanitary Commission in the Bowie-Glenn Dale section and the Temple Hills-Camp Springs area southwest of the District of Columbia. These area proposals are the initial steps toward fulfillment of the regional water supply plan of the commission, which will eventually encompass large areas in southern and central Maryland. Included in the proposals are provisions for the financing, construction and operation of water supply facilities in the two areas.

(*Continued on page 10*)

TENNESSEE CORPORATION
Ferri-Floc
FERRIC SULPHATE

DEPENDABLE! ECONOMICAL!

Ferri-Floc is a partially hydrated ferric-sulfate that gives lower operating cost. Ferri-Floc is readily soluble in coldest water, gives off no corrosive fumes in warmer water, making fans on solution pot entirely unnecessary. It does not pass through a gummy stage going into solution and can be stored in open bins for indefinite periods of time.

For further information of Ferri-Floc, the superior coagulant, that will lower your operating cost in the treatment of water, industrial waste, sewage, and sludge conditioning. Write the Tennessee Corporation, Grant Building, Atlanta 1, Georgia.

TENNESSEE TC CORPORATION
Atlanta, Georgia Cockland, Ohio

WF

Cast Iron Pipe

Manufactured in Sizes 2" to 96"—

Bell and Spigot Pipe **Special Castings**

Flanged Pipe **Flexible Joint Pipe**

Short Body B. & S. Specials

Warren Spun Centrifugally Cast Iron Pipe

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Sales Offices
11 Broadway, New York 4, N. Y.
75 Federal St., Boston 10, Mass.

Works
Phillipsburg, N. J.
Everett, Mass.

(*Continued from page 8*)

Clarence M. Rainey, Water Superintendent, Pocatello, Idaho, died on March 1, after several months of illness.

Having entered the employ of the Pocatello water system in 1903, Rainey remained with the organization when it was purchased by the city in 1913. In 1917, he was appointed superintendent and from that time served continuously in that position until his death. His Active Membership in the Association dated from November 1927.

J. C. Perlas, Chief Engr., Manila Water Dist., Republic of the Philippines, took the occasion of paying his 1947 dues to forward to Association headquarters a letter he had intended to mail more than five years ago. Dated December 4, 1941, the letter addressed to the A.W.W.A.'s previous offices enclosed two money orders in payment for 1942 dues and for the *Manual of Water Quality and Treatment.* Perlas' explanation was:

> When these were to be mailed, the war broke out and I kept them all these years. They outlived two lootings and luckily escaped destruction by fire. I attach sentimental value to these papers, for somehow, to me, they symbolize the fate of my beloved country and people during those dark years from the outbreak of war through the Japanese occupation and up to our liberation by the United States Forces. Perhaps you will think me a bit too sentimental, but we who have undergone that ordeal of hell and fire under the boots of a cruel invader cannot easily forget those days of humiliation and sufferings and cannot help thinking how lucky we are to have come out of it alive.

The letter and the money orders, on which the ink has by now begun to fade, are being preserved in the Association files. Those who missed Lloyd K. Clark's description of his contact with Perlas during the first days of the American Army occupation of Manila in 1945 will find his report on page 612 *et seq.* of the May 1946 JOURNAL.

(*Continued on page 12*)

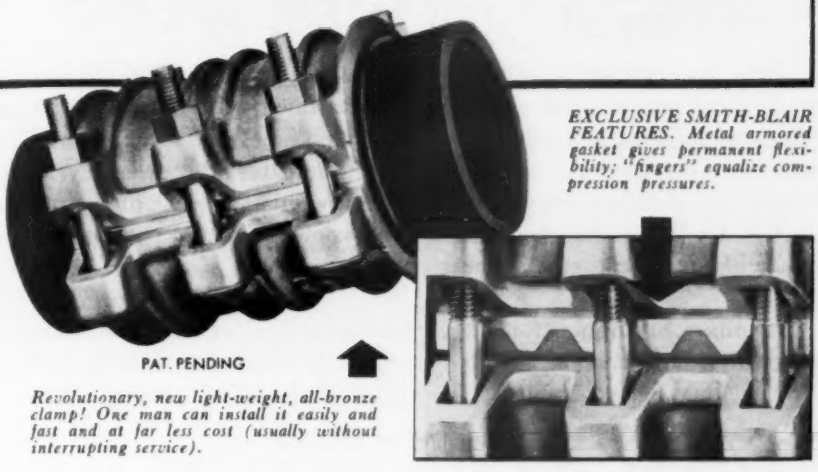
ZECO GREENSAND ZEOLITE

ZECO and HI-ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.

90 WEST STREET NEW YORK 6, N. Y.

This *NEW* CLAMP Repairs Broken Pipe in 6 Minutes



PAT. PENDING

Revolutionary, new light-weight, all-bronze clamp! One man can install it easily and fast and at far less cost (usually without interrupting service).

EXCLUSIVE SMITH-BLAIR FEATURES. Metal armored gasket gives permanent flexibility; "fingers" equalize compression pressures.

One man can repair a broken or split cast iron or asbestos-cement water pipe in 6 minutes. (Exclusive of excavating time.) Place this remarkable new coupling under and over the pipe break—tighten 6 nuts from top-side—that's all! Smith-Blair guarantees the permanence and pressure holding ability of this clamp (up to 1000 p.s.i. for 4" size!). New sealing and clamping principles put this clamp in a class by itself! Available for 4", 6", 8", 10" and 12" pipe. Two lengths 7½" (illustrated) and 15". When ordering specify for cast iron or cement-asbestos pipe.

Now stocked by Smith-Blair Distributors in Principal Cities. SB-12

SMITH BLAIR
Water works supplies and specialties
INC.
SOUTH SAN FRANCISCO • CALIFORNIA

The New, Better
FAST ACTION
REPAIR CLAMP
CAST BRONZE • FULL CIRCLE

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

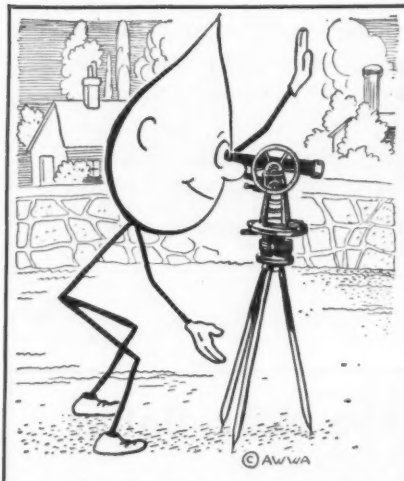
(*Continued from page 10*)

Glace Bay, N.S., water works employees recently were afforded the benefits of a municipal pension plan, when the town adopted a retirement program covering all general and utility employees. In establishing the program, Glace Bay became the first municipality in the province to take advantage of the enabling legislation placed in the statutes of Nova Scotia in 1946.

No polygamist, William M. Schnaible, Water Supt., as well as head of the police, street and lighting departments for the town of Grass Lake, Mich., must still submit to the dictates of at least seven of the fairer sex. The certain seven are the women candidates who swept every seat in the local elections when the town's 800 population went to the polls on March 10. The uncertain eighth, of course, is the possible "Mrs." Schnaible, not mentioned in the report.

Robert S. Ingols, formerly Instructor in Public Health Eng. at the Univ. of Michigan, recently accepted a position as Research Assoc. Prof. of San. Chemistry at the Georgia School of Technology, Atlanta.

(*Continued on page 14*)



Mapping out a Public Relations Campaign?

Let Willing Water help you . . . he's the master of all he surveys. Let him clear the brush of public ignorance of water works problems. Let him erect for you an edifice of public appreciation and co-operation on a foundation of good will.

Willing Water is waiting to meet your customers and employees. Right now he has 32 different approaches to your problems in the form of low-cost blocked electrotypes or newspaper mats. And he's only beginning his career. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
500 Fifth Avenue · New York 18, New York

Before You Buy ANY Domestic Water System
See the PEERLESS Water King Advantages!

Exclusive Water King Features

SIMPLIFY WATER PUMPING—LOWER COSTS

The Most Advanced Pumping Principle in the Last 10 Years

"Magic Wings to Water Lift"

The trouble-free simplicity of the patented Peerless Water King is a real innovation in water pumping. Here is the ideal pump for domestic and light industrial water systems, meeting every requirement for simplified pumping at lower costs.

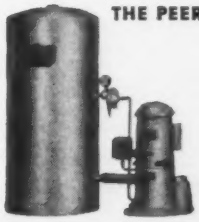
The Peerless Water King is the pump with "Magic Wings to Water Lift." The Water King is a shallow well pump, embodying an exclusive "magic" pumping element: a hard chrome rotor revolving in a rubber stator that draws water upward and forces it into pressure tank—the most advanced pumping principle in the past 10 years. Capacities: 275 to 860 g.p.h., against pressures up to 40 lbs. *There are no parts of the pump underground.* 100% automatic. Easily installed over the well or offset. Pumping element highly resistant to abrasive and corrosive action. Finely engineered—Compact—Quiet—Trouble-free.

PLAN WITH PEERLESS

Peerless has a pump for all your needs for water—from 10 to 220,000 gallons per minute! Write to Peerless factory or district office for literature and name of nearest dealer. *Descriptive Bulletins available.*

PEERLESS PUMP

THE PEERLESS WATER KING



Covered by Peerless Patent 2,346,428 Mfd. under R. Moineau's U. S. Letters Patents 1,892,217-2,028,407—Reissue 21,374 and Canadian Patent 352,574; Robbins & Myers, Inc., Sole U. S. and Canadian Licensee.

2 PEERLESS DOMESTIC WATER SYSTEMS

A PEERLESS JET SYSTEM, TOO

For Deep or Shallow Wells. Capacities: 120 to 7500 g.p.h. Lifts up to 120 feet.

This amazingly simple and compact Peerless Jet Water System produces all the water you want for normal light industrial operating requirements. It is a pressure system, entirely automatic, and occupies little more space than an electric motor. A Peerless Jet Water System offers a lifetime of trouble-free water service at minimum cost. Can be installed over well or offset.

Write for Bulletin B-155-1 describing Jet Water System in detail.

PEERLESS PUMP DIVISION
FOOD MACHINERY CORPORATION

Factories: Canton 6, Ohio Quincy, Illinois Los Angeles 31, California
District Offices: Canton 2, Ohio; Ardmore, Pa.; Decatur, Ga.; Dallas 1, Texas

(*Continued from page 12*)

Marion E. Boriss became City Engr. of Chattanooga, Tenn., on February 1, resigning his position as San. Engr. of Jefferson County, Ala., to take over the new post.

William O. Lovejoy, former Chemist & Bacteriologist of the Louisville, Ky., Water Co., became Florida Dist. Mgr. and Sales Engr. for the Liquid Conditioning Corp. on March 1. In addition to his duties for the company, he expects to engage in some private consulting engineering activity in the field of water purification and softening as well as contracting work in well drilling.

Edward W. Hopkins, whose twenty years of service with the Utica, N.Y., Board of Water Supply filled out more than a half-century of family association with Utica's water system, through father, son and grandson, resigned his position as Supt. of Construction to enter the engineering department of the city's Public Service Commission on February 1. Hopkins, who has been an A.W.W.A. Active Member since August 1925, was earlier associated with the Neptune Meter Co.

(*Continued on page 16*)

3 *Money, Time and Labor Saving Features of*

UNIVERSAL CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.

For water supply, fire protection systems, sewage disposal systems, industrial, and irrigation. Flexible.

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THE CENTRAL FOUNDRY COMPANY
386 FOURTH AVENUE, NEW YORK 16, N. Y.

Gentlemen: Send us information and catalog on UNIVERSAL CAST IRON PIPE.

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STREET_____

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Standard—"Traffic Model"—Flush Type—Water Crane Type

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Gate Valves

Non-Rising Stem—Outside Screw and Yoke—Hub End—Flanged End—Ends to Fit Any Type Pipe

Also—Floor Stands, Shear Gates—Tapping Sleeves and Valves—Flap Valves—Mud Valves

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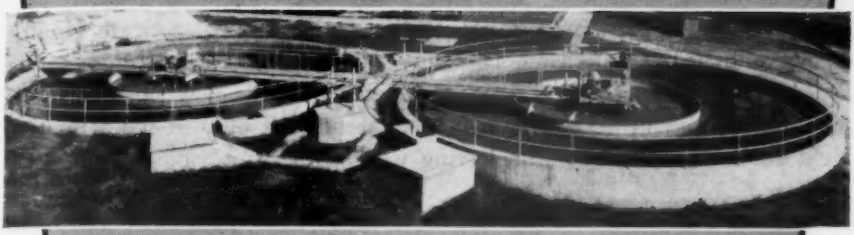
ACCELATOR



THE

MODERN WATER TREATING PLANT

OVER 600 SUCCESSFUL INSTALLATIONS

The ACCELATOR is new enough to be exclusively different in design, yet old enough to be thoroughly proved in performance.

It is the result of more than a half a century of intensive research and development by Infilco water conditioning specialists.

The ACCELATOR combines in one compact tank the former separate steps of quick mixing, coagulating, settling, and sludge removal.

Raw water and chemicals are intermingled with a constantly circulating well-coagulated slurry, and chemical reaction takes place almost instantly on the surface of old particles. Clear treated water rises at a high rate from the surface of the circulating slurry pool.

Write for Bulletin 1824. INFILCO Inc., 325 West 25th Place, Chicago 16, Illinois.

IF YOU WANT TO KNOW — ASK INFILCO

(*Continued from page 14*)

Paul J. Kleiser recently left his post as Chief San. Engr. at Camp Campbell, Ky., to return to consulting engineering work as a partner in the firm of Thomas T. Hardman, Terre Haute, Ind.

Ben L. Williamson left his position with the Iowa State Health Dept. on April 1 to become Director, Div. of Sanitation, Kansas State Board of Health, replacing Paul D. Haney. In his new position, Williamson has the advantage of broad experience not only in the sanitation field but in the division itself, having worked there previously from 1935 to 1942.

Charles L. Fox, Vice-Pres., Pennsylvania Water Co., Wilkinsburg, retired from that position on February 1 after more than 44 years of continuous service with the company. Having joined the organization as an inspector in 1902, Fox grew with it and made many contributions to its development. At the time of his retirement, he held the positions of Chief Engr., Gen. Supt. and Purchasing Agent in addition to his vice-presidency. Fox, whose Active Membership in the A.W.W.A. dates to June 1912, was honored by the Western Pennsylvania Section in 1946 with the presentation of the George Warren Fuller Award.

Boyd A. Bennett recently retired as President of Water Utilities Service Corp., New York, and accepted a position as City Manager of Clearwater, Fla., thus terminating his almost twenty years' of close association with the water works field and returning to public administration.

Prior to his joining the Federal Water Service Corp. as an engineer in 1929, Bennett had extensive experience in both engineering and administrative work, having served as City Engineer for the cities of Conneaut, Ohio, and Lynchburg, Va., and as City Manager of Charlottesville, Va., and Bluefield, W.Va. Since 1929, Bennett has served as Vice-Pres., South Bay Consolidated Water Co., Asst. Vice-Pres., New York Water Service Corp., and Pres., Northeastern Water & Electric Service Corp. and its numerous affiliated utility companies.

In taking over the managership of Clearwater on March 3, Bennett assured himself a retirement that would keep him active and in touch with his former associates in the engineering and utility fields.

(*Continued on page 18*)

GENUINE COOK WELL STRAINERS
REG. U. S. PAT. OFF.

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Lawrenceburg • Indiana
Manufacturers of
Vertical Turbine Pumps, 10 to 10,000 gpm.
Well Strainers, 2 to 40 in.
Water Systems; Shallow Well, Deep Well and Ejector
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DEEP WELL COOK PUMPS
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CAST IRON PIPE AND FITTINGS

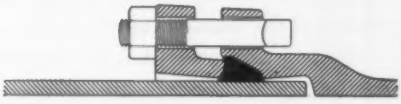
CAN BE FURNISHED TO MEET THE REQUIREMENTS OF ALL EXISTING SPECIFICATIONS

SUPER-deLAVAUD CENTRIFUGALLY CAST IRON PIPE

The standard water bell is the most common type of cast iron pipe joint—popularly known as the "bell and spigot" joint. Available in sizes 3 to 24 inches inclusive, in 12 and 18-foot lengths, and for working pressures up to 250 pounds.

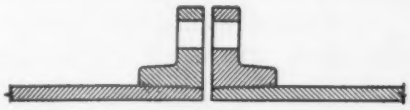
Standard Water Bell

A time-saving, easily installed mechanical joint cast iron pipe now used extensively. Made in all sizes from 3 inches through 24 inches, in 18-foot lengths, and for pressures up to 250 pounds.



"C-N" Mechanical Joint

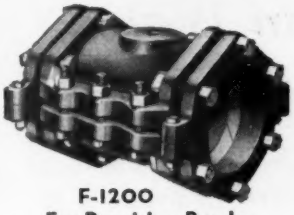
Cast iron flanged pipe is widely used for exposed pipe line work, inside and outside of buildings, for conducting water, steam, gas, oil and other fluids. Comes in same sizes and for same pressures as listed above, and in laying lengths, as ordered, up to 18-feet.



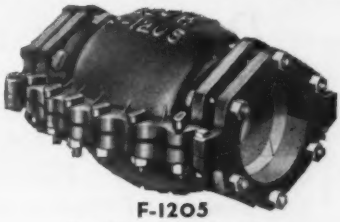
Flanged Joint

CLOW MECHANICAL JOINT SPLIT REPAIR SLEEVE

NO LEADING OR CALKING—ONLY A RATCHET WRENCH NEEDED



F-1200
For Repairing Breaks
Through Pipe Barrel



F-1205
For Repairing Breaks
Through Pipe Joints

It is better to have Clow Split Sleeves on hand and NOT need them than to NEED them and not have them.

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NATIONAL CAST IRON PIPE DIVISION
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Everything for the municipal water supply system

(*Continued from page 16*)

Ralph E. Roderick, former City Engr. & Supt. of Utilities at Garnett, Kan., is now doing design work and writing specifications for both water treatment and sewage disposal plants for the firm of Cornell, Howland, Hayes & Merryfield, Corvallis, Ore. Earlier he spent six years with the Paulette & Wilson Engineering Co. of Kansas.

The announcement of tritium, a new "super-water" that is triple-heavy and radioactive, may well give pause to stick-in-the-mud water works men who produce strictly light-weight H_2O. When deuterium—just plain "heavy water"—entered the scene in 1931, Prof. Harold C. Urey won a Nobel Prize for its discovery. Now tritium holds the promise of tremendous advances in chemistry, medicine and allied commercial fields. And Dr. G. E. Boyd of the Isotopes Branch, Atomic Energy Com., who presented the announcement at the spring meeting of the American Chemical Society contends that the future holds almost innumerable possibilities for the application of radioactive isotopes to scientific problems. Not in doubt, but in ignorance, we must plug along unsung with the old-fashioned product, musing perhaps about some coming "super-duper-ium."

Of course, all this is old stuff to the A.W.W.A., whose Arthur Buswell announced "tritium" in the September 1938 JOURNAL.

(*Continued on page 20*)

DIFCO

Detection of Coli in Water

This group of Difco Dehydrated Culture Media is recommended for the detection and confirmation of the presence of coliform bacteria in water. Each medium is prepared to conform to all requirements of "Standard Methods of Water Analysis" of the A. P. H. A. and A. W. W. A.

Bacto-Lactose Broth
Bacto-Endo Agar
E. M. B. Agar (Levine)
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is a precision recording instrument not just a machine . . . Its accuracy, dependability, and low maintenance cost have been recognized by water works officials for more than half a century.

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(*Continued from page 18*)

The Foxboro Co., Foxboro, Mass., recently announced the sale of its 18,000th copy of *Principles and Practice of Flow Meter Engineering*, a handbook prepared primarily for the use of operating men in the field, but used also as a textbook in engineering schools and as a guide by apparatus manufacturers whose flow problems affect the design and performance of their equipment. Now in its sixth edition, the book has been kept up to date by the co-operative interest of its many users.

National Water Main Cleaning Co. has announced the election of J. A. deCamp as President to fill the vacancy left by the death of Clinton Inglee. The new president has been associated with the company both as director and officer since 1914, with a short interruption for service in the Navy during the first World War. In 1941 he was elected Secretary and Treasurer of the company, and later, Vice-President.

At the same meeting J. A. Frank, recently appointed Vice-President and General Manager, was made Executive Vice-President; and James R. Brown, Chicago Branch Manager, was elected Vice-President in Charge of Sales Promotion.

(*Continued on page 22*)

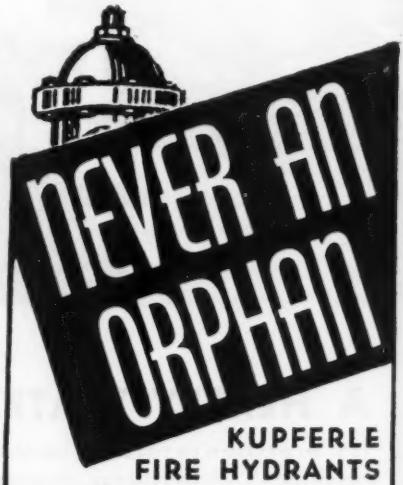
LAYING BELL & SPIGOT WATER MAIN?
Using *this* Jointing Compound
BACK FILLING CAN START AT ONCE!

Tegul-MINERALEAD

Brings you these Advantages

Less initial leakage. Trenches can be closed quickly, doing away with this traffic hazard • Easy to melt and pour. Ingot holds correct composition. Immune to moisture; needs no outdoor protection when stored on job • Gives joints with far above usual resistance to mechanical and thermal shock • From coast to coast *Tegul*-MINERALEAD is cutting laying and maintenance costs on bell & spigot lines. Write for bulletin.

THE ATLAS MINERAL PRODUCTS CO. of Pa
Mertztown . Pennsylvania



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FIRE HYDRANTS

Assured maintenance of fire hydrants is a prime consideration. You can get parts for Kupferle Fire Hydrants installed a half century ago . . . and will be able to get parts for the hydrants of today fifty years hence.

JOHN C. KUPFERLE FOUNDRY CO. . . ST. LOUIS

Welded Steel Water Tank

The 50,000-gal. elevated steel tank illustrated above provides gravity pressure in the water system serving Pittsfield Village, a housing project between Ann Arbor and Ypsilanti, Mich. It is a standard ellipsoidal-bottom structure with cylindrical columns and an ellipsoidal roof. Welded construction was used throughout.

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BIRMINGHAM CHICAGO TULSA HAVANA
PHILADELPHIA NEW YORK DETROIT CLEVELAND
SAN FRANCISCO HOUSTON ATLANTA LOS ANGELES

(*Continued from page 20*)

Edward F. Tanghe, formerly principal engineer of research and design for the Milwaukee, Wis., Water Works, was appointed to the newly created position of Assistant Superintendent on April 1. An employee of the city since 1927, when he was employed as senior engineer, Tanghe went to the city water works in 1934 as pitometer engineer to spend three years making a study of water pressures and flows in the water distribution system. Upon completion of the survey in 1937, he took over responsibility for the department's research and design activities.

Kenneth K. King has resigned his position as Director, Kansas City, Mo., Dept. of Public Works, to become General Manager of the C. S. Foreman Co., heavy construction firm of that city. Prior to his supervision of public works activities, King was director of the Kansas City Water Dept.

(*Continued on page 48*)

A.W.W.A. 1947 CONFERENCE

San Francisco—July 21–25

SPECIAL TOURS

NEW YORK SPECIAL

En Route

Leave: New York, 1:25 P.M., Monday, July 14

Arrive: San Francisco, Sunday Morning, July 20

Stop-Overs: Rocky Mt. National Park, Salt Lake City, Boulder Dam, Las Vegas and Los Angeles

Return

Leave: San Francisco, 6:00 P.M., Friday, July 25

Arrive: New York, 8:30 A.M., Sunday, August 3

Stop-Overs: Portland, Victoria (Canada), Glacier National Park

Round trip from New York approximately $450 on all-expense tour basis. (Does not include expenses in San Francisco.)

For Information

E. A. Sigworth, Suite 1333, 230 Park Avenue, New York 17, N.Y.

DIXIE SPECIAL

En Route

Leave: New Orleans, 11:30 P.M., July 14

Arrive: San Francisco, 7:30 A.M., July 20

Stop-Overs: El Paso and Grand Canyon

Return

Leave: San Francisco, 9:00 P.M., July 25

Arrive: Kansas City, 8:10 A.M., July 30

Stop-Overs: Los Angeles, Boulder Dam, Salt Lake City, Denver (short time)

Round trip from New Orleans approximately $175 for rail and pullman. Cost of meals and sightseeing tours will be extra.

For Information

W. H. Weir, Atlanta, Ga.

Egmont S. Smith, Dallas, Tex.

A. P. Black, Gainesville, Fla.

Thomas L. Amiss, Shreveport, La.

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~ 1946 ~

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CHANGES IN MEMBERSHIP

NEW MEMBERS

Applications received March 1 to 31, 1947

Aid, F. N., Salesman, Johns-Manville Sales Corp., 2102 Hayden St., Amarillo, Tex. (Jan. '47)

Alcorn, James Dunn, Physicist, Hydraulic Div., A. O. Smith Corp., 524 Hermosa St., South Pasadena, Calif. (Jan. '47)

American Viscose Corp., Robert R. Gushard, Control Chemist, Lewistown, Pa. (Corp. M. Jan. '47)

Anderson, Mark J., *see* Anderson, Mark J., & Co.

Anderson, Mark J. & Co., Mark J. Anderson, Pres., Box 803, Tampa 1, Fla. (Assoc. M. Jan. '47)

Ankener, Angelo, Asst. Engr., Dept. of Water Supply, Gas & Electricity, 107–38—134th St., Richmond Hill 19, N.Y. (Jan. '47)

Barrett, Max L., San. Engr., State Board of Health, 1700 N. Harrison St., Ft. Wayne 7, Ind. (Jan. '47)

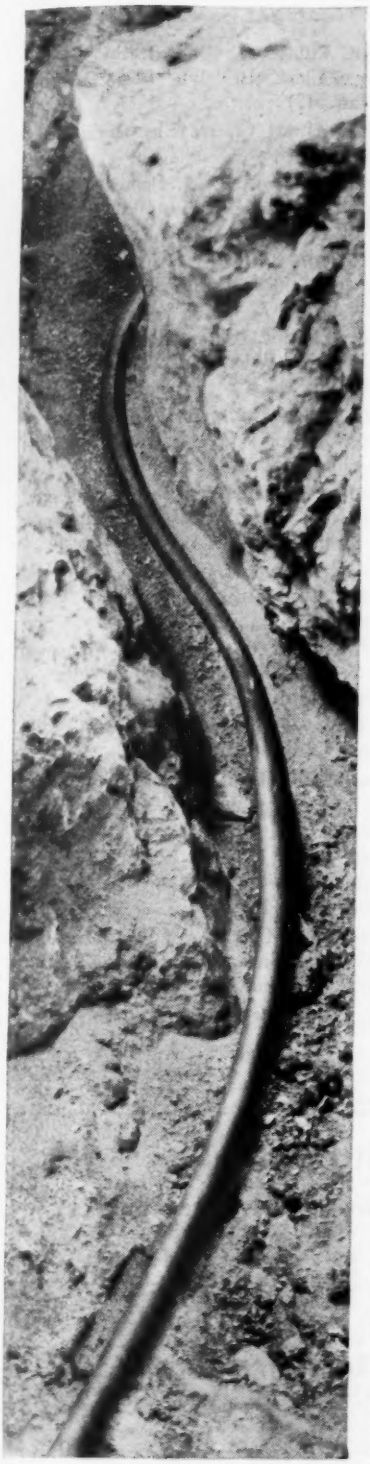
Birkinbine, W. C., Asst. Maint. Engr., Housing Authority of Bremerton, Box 631, Bremerton, Wash. (Jan. '47)

Boyer, Allen, Supt., Water Dept., Hoquiam, Wash. (Jan. '47)

Breedlove, Sam R., Field Engr., Wallace & Tiernan Co., Inc., 2610—1st St., Lubbock, Tex. (Jan. '47)

Breimeister, Harry, Asst. Research Engr., Water Works, City Engr.'s Office, City Hall, Milwaukee 2, Wis. (Jan. '47)

(*Continued on page 30*)



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install easier, serve longer

• Water service lines of copper tube mean savings in both installation and maintenance costs. In underground installations, copper tube can be easily bent to clear obstructions, and this *flexibility* also compensates for expansion and contraction and the shifting of soil. Coils of copper tube are easy to transport and can be cut to exact lengths on the job, reducing scrap and the number of fittings required.

Once installed, a service line of copper provides many years of uninterrupted service. Copper is highly resistant to corrosion and tubes can never become clogged with rust. Compared with other commercial materials, copper is as nearly permanent as you can find for water service lines.

Anaconda Copper Tube assures long, dependable water service. 47186

ANACONDA
from mine to consumer

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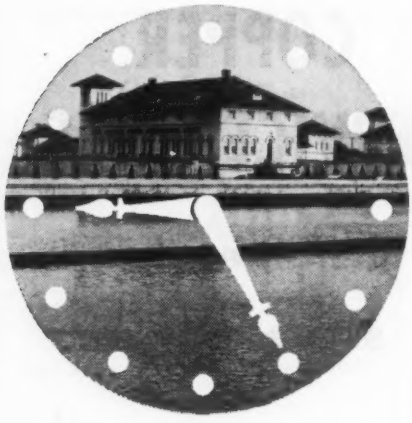
New Toronto, Ont.



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SOLVAY LIQUID CHLORINE

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(*Continued from page 28*)

Bricelyn, Village of, Clifford J. Peterson, Village Clerk, Bricelyn, Minn. (Corp. M. Jan. '47)

Brumley, Albert C., *see* Electronic Purification Corp.

Burnaby, Corp. of, S. M. Porter, Munic. Engr., Edmonds, New Westminster, B.C., Can. (Corp. M. Jan. '47)

Burt, Gordon L., Capt., San. Engr., U.S. Army, Station Hospital, March Field, Calif. (Jan. '47)

Carstairs, James, Water Dept., Township of Sandwich West, River Canard, Ont., Can. (Jan. '47)

Chaffee, William N., Asst. Mgr., Board of Water Supply, 2311 Armstrong St., Honolulu, Hawaii (Jan. '47)

Chamblee, Graham V., Forest Mgr., Newport News Water Works Com., Denbigh, Va. (Jan. '47)

Chawner, W. Rupert, Gen. Mgr., Temescal Water Co., Box 187, Corona, Calif. (Jan. '47)

Clements, Alfred J., Supt., Princeton Water Co., 209 Harrison St., Princeton, N.J. (Jan. '47)

Coates, W. W., *see* Monte Vista County Water Dist.

Colfax Water Dept., Hans S. Paulson, Supt., Colfax, Wash. (Corp. M. Jan. '47)

Connell, C. J., Partner, Black Hawk Soft Water Service, 1528 Waterloo Rd., Cedar Falls, Iowa (Jan. '47)

Cornell, Russel M., Asst. Prof., Dept. of Civ. Eng., Univ. of Minnesota, Minneapolis 14, Minn. (Jan. '47)

Craig, W. G., *see* Grove Regulator Co.

(*Continued on page 32*)

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PROMPT SHIPMENT IN BULK OR IN BAGS OF 100 LB. EACH.

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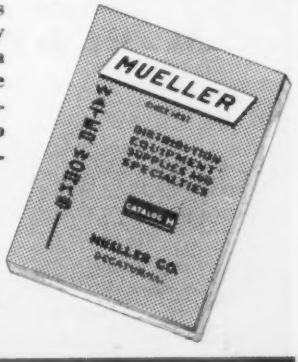

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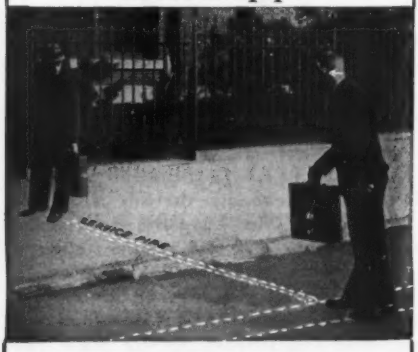
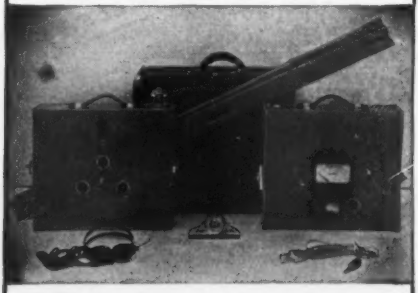
The Old Way

The New Way
to locate pipe



with the
M-SCOPE



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Crawford, Lawrence C., Dist. Engr., U.S. Geological Survey, 508 Hydraulic Lab., Iowa City, Iowa (Jan. '47)

Cunningham, R. W., City Engr. & Water Supt., Emporia, Kan. (Jan. '47)

Daniels, Roy D., Chemist, Water Works Dept., 717—29th St., Parkersburg, W.Va. (Jan. '47)

Darby, Charles, City Engr., Sabetha, Kan. (Apr. '47)

Davis, H. M., Chemist, Canadian Breweries, Ltd., 496 Queen St., E., Toronto, Ont., Can. (Jan. '47)

Day, Kenneth A., Mech. Supervisor, Board of Water Comrs., City & County Bldg., Denver 1, Colo. (Apr. '47)

Duvauchelle, Henry N., Supt., Service & Meter Div., Board of Water Supply, Box 3410, Honolulu 1, Hawaii (Jan. '47)

Electronic Purification Corp., Albert C. Brumley, 516 N. Charles St., Baltimore 1, Md. (Assoc. M. Jan. '47)

Fairview County Water Dist., F. B. Owen, Pres., Costa Mesa, Calif. (Corp. M. Jan. '47)

Finley, Charles A., Cons. Engr., 1802 Law & Finance Bldg., Pittsburgh 19, Pa. (Jan. '47)

Fisher, Carl L., Deputy City Engr., City Hall, Lincoln, Neb. (Jan. '47)

Flynn, A. P. Mickey, Meter Repairman, The Wichita Water Co., 301 N. Main St., Wichita, Kan. (Jan. '47)

Fooks, Jack H., San. Engr., Inst. of Inter-American Affairs, Caixa Postal 201, Victoria, Espirito Santo, Brazil (Jan. '47)

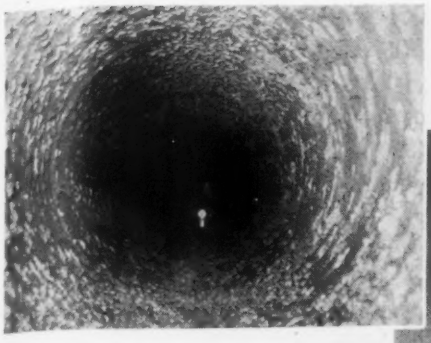
Foster, E. Ronald, Sr. Utilities Engr., California Public Utilities Com., 368 State Bldg., San Francisco, Calif. (Jan. '47)

Fox, C. Maynard, Asst. Distributor, City of Lawrence, 1000 Ohio St., Lawrence, Kan. (Jan. '47)

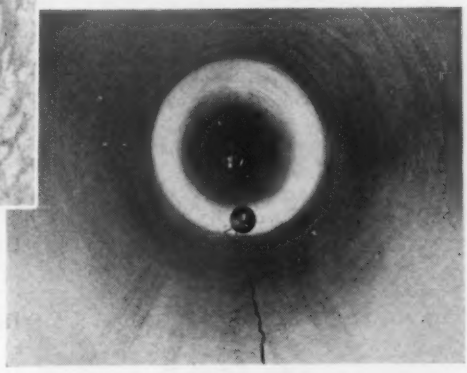
Francis, A. L., Water Works Supt., Corp. of Burnaby, Edmonds, New Westminster, B.C., Can. (Jan. '47)

Gilmore Steel & Supply Co., Charles A. Lundy, Salesman, Pipe, Valve & Fitting Dept., 840 Brannan St., San Francisco, Calif. (Assoc. M. Jan. '47)

(*Continued on page 34*)



Newark, New Jersey, Pequannock Aqueduct No. 1. Left: Tuberculated Section before cleaning. Right: Section after cleaning and cement lining.



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Gonzalez, Juan E., Engr., City Water Dept., Calle Costa Rica 113, Quito, Ecuador (Jan. '47)

Goodrich, O. M., City Mgr., Stockton, Kan. (Jan. '47)

Green, Wallace, Water Supt., Gresham, Ore. (Jan. '47)

Grove Regulator Co., W. G. Craig, Administrative Asst., 6529 Hollis St., Oakland 8, Calif. (Assoc. M. Jan. '47)

Gushard, Robert R., *see* American Viscose Corp.

Hansen, Robert E., Supt., Filtration Plant & Pumping Station, R.F.D. Route 4, Box 228, Mt. Clemens, Mich. (Jan. '47)

Hee, Wah Ching, Civ. Engr., Board of Water Supply, Box 3410, Honolulu 1, Hawaii (Jan. '47)

Higgins, Waldo W., Mgr. of Quality Control, A. O. Smith Corp., Kankakee, Ill. (Jan. '47)

Holzmacher, H. G., Civ. Engr., Bethpage, N.Y. (Jan. '47)

Huick, C. R., Sales-Hydr. Eng. Div., Johns-Manville Sales Corp., 777 Thomas St., Seattle, Wash. (Jan. '47)

Hunter, H. R., Cons. Engr., 105 W. English St., Wichita 2, Kan. (Jan. '47)

Johnston, Lewis Z., Jr., City Engr., Drawer 868, Buena Vista, Va. (Jan. '47)

Kay, L. A., *see* Manitoba Dept. of Health & Public Welfare

Kingsbury, Harold N., Dist. Engr., State Board of Health, Box 31, Ashland, Wis. (Jan. '47)

Lake, George W., Township Engr., Municipality of Township of Whitney, Porcupine, Ont., Can. (Apr. '47)

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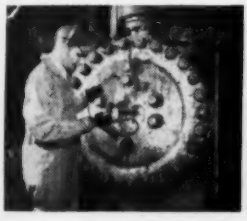

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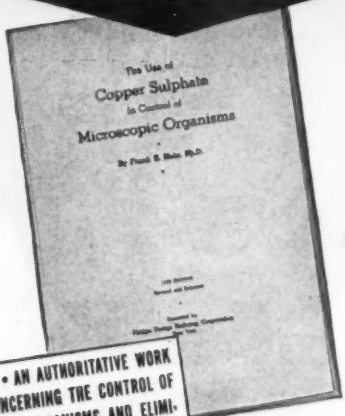

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(*Continued from page 34*)

Langdon, Bernard J., San. Engr., State Board of Health, Butler County Health Dept., El Dorado, Kan. (Jan. '47)

Lanigan, Roy A., Acting Supt., Water Dept., 1454 Balboa Ave., Burlingame, Calif. (Apr. '47)

Leary, Dennis M., Jr., Civ. Engr., 305—4th St., Beckley, W.Va. (Jan. '47)

Lemieux, Roland A., Mgr. & Engr. in Charge, City of Arvida, City Office, Box 2, Arvida, Que., Can. (Apr. '47)

Lepanto Board of Public Utilities, John S. Mosby, Atty., Lepanto, Ark. (Corp. M. Jan. '47)

Light, Kenneth, Water Supt., Steilacoom, Wash. (Jan. '47)

Lundy, Charles A., *see* Gilmore Steel & Supply Co.

Luverne, City of, Elmer K. Thon, Supt., Water Dept., Luverne, Minn. (Corp. M. Jan. '47)

Maclennan, W. E., Acting City Engr., Eng. Dept., City Hall, Donald St., Fort William, Ont., Can. (Jan. '47)

Manitoba Dept. of Health & Public Welfare, L. A. Kay, Director, Bureau of Public Health Eng., 320 Sherbrook St., Winnipeg, Man., Can. (Corp. M. Jan. '47)

Metzler, Dwight F., San. Engr., State Board of Health, Univ. of Kansas, Lawrence, Kan. (Jan. '47)

Monte Vista County Water Dist., W. W. Coates, Supt., 946 S. Central, Ontario, Calif. (Corp. M. Jan. '47)

Moore, W. R., Vice-Pres. & Mgr., Cumberland Water Co., Big Stone Gap, Va. (Jan. '47)

Morgan, Alan W., Chem. Engr., H. L. Blachford, Ltd., 977 Acqueduct St., Montreal, Que., Can. (Jan. '47)

Mosby, John S., *see* Lepanto Board of Public Utilities

Nelson, Myron K., San. Engr., State Board of Health, Univ. of Kansas, Lawrence, Kan. (Jan. '47)

Novaro, Joseph A., Engr., Clarence Blair Assoc., Inc., Box 236, New Haven, Conn. (Jan. '47)

Owen, F. B., *see* Fairview County Water Dist.

Paulson, Hans S., *see* Colfax Water Dept.

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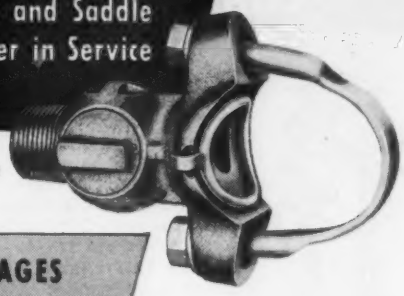

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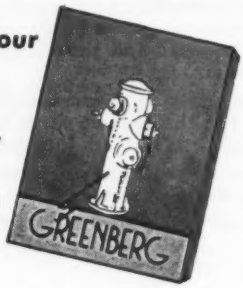

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Penland, Fred M., Accountant, Water Dept., 215 W. Broadway, Long Beach 5, Calif. (Jan. '47)

Peterson, Clifford J., *see* Bricelyn, Village of

Port Colborne, Municipal Council of the Town of, J. R. Scott, Town Engr., Port Colborne, Ont., Can. (Corp. M. Jan. '47)

Porter, S. M., *see* Burnaby, Corp. of

Poulsen, Russell E., Chemist, Filtration Plant, 2425 Sheridan Rd., Evanston, Ill. (Jan. '47)

Powers, O. C., Director & Medical Health Officer, Oxford County & Ingersoll Health Unit, Woodstock, Ont., Can. (Jan. '47)

Proseus, H. H., Salesman, Pipe Div., Johns-Manville Sales Corp., 711 S.E. Alder, Portland, Ore. (Jan. '47)

Randall, E. T., Supt. of Water Works, Olathe, Kan. (Jan. '47)

Reeves, H. L., Mgr., Erwin Utilities, 211 S. Main St., Box 201, Erwin, Tenn. (Jan. '47)

Robinson, James M., Sales Repr., Rensselaer Valve Co., 38 Main St., Hornel, N.Y. (Jan. '47)

Robke, Robert, Water Works Supt., Plentywood, Mont. (Jan. '47)

Ross, T. T., State Health Officer, State Board of Health, Little Rock, Ark. (Jan. '47)

Rossio, C. J., Johns-Manville Corp., 711 S.E. Alder, Portland, Ore. (Jan. '47)

Schmitz, George E., Operator, Water Works, Wilmette, Ill. (Jr. M. Jan. '47)

Schudlich, H. M., Engr. of Water Service, Northern Pacific Ry., St. Paul, Minn. (Jan. '47)

Scott, J. R., *see* Port Colborne, Municipal Council of the Town of

Scribner, A. K., *see* Virginia Smelting Co.

Sharts, Paul E., Tech. Service Div., Wallace & Tiernan Co., Inc., 190 Orchard Pl., Ridgewood, N.J. (Jan. '47)

Skyrius, Walter M., Sales Repr., Johns-Manville Sales Corp., 819 Lincoln St., Waukegan, Ill. (Jan. '47)

Strock, B. F. (Mrs.), Owner, Ben Ali Water Co., 2271 Pyramid Way, Bellview Village, Sacramento 15, Calif. (Jan. '47)

(*Continued on page 40*)

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Thomas, W. M., Cons. Engr., Cleveland, Miss. (Jan. '47)

Thompson, Frank, Supervisor, Water Supply & Sewage Disposal, U.S.N. Ammunition Depot, Elnora, Ind., (Jan. '47)

Thon, Elmer K., *see* Luverne, City of

Van Meter, L. R., Sales Engr., Neptune Meter Co., 1360 Bryn Mawr Ave., Chicago, Ill. (Jan. '47)

Velez, Jorge Forero, Ing. Civ. de la U.N. de Colombia, Avenida 33, No. 16–66, Bogota, Colombia (Jan. '47)

Virginia Smelting Co., A. K. Scribner, Gen. Mgr., West Norfolk, Va. (Assoc. M. Jan. '47)

Wallbom, David E., Chief Utility Accountant, Seattle Water Dept., 323 County City Bldg., Seattle 4, Wash. (Jan. '47)

Wheeler, W. W., Jr., Cons. Engr., Cochrane, Hendrix, Fell & Wheeler, Cons. Engrs., Palace Bldg., Tulsa, 3, Okla. (Jan. '47)

Willis, Jack, Supt., Sylvan Water Dist., 2929 S.W. West Slope Drive, Portland 1, Ore. (Jan. '47)

REINSTATEMENTS

Bruce, C. J., Supt., Evitts Creek Water Co., R.D. No. 3, Cumberland, Md. (June '29)

Edwards, Howard L., R. W. Sparling, 945 N. Main St., Los Angeles 12, Calif. (Apr. '44) *P*

Five, Helge, Sr. Park Engr., Long Island State Park Com., 7 N. Ravine, Great Neck, N.Y. (Jan. '39)

Kirby, R. W., Mgr., Mullens Water Works, Inc., Mullens, W.Va. (Oct. '24)

Magsaysay, Ambrosio, *see* Metropolitan Water Dist.

Marshall, George A., Chief Clerk, Water Dept., Portland, Ore. (Apr. '30)

Metropolitan Water Dist., Ambrosio Magsaysay, Mgr., 176 Arroceros, Manila, P.I. (Corp. M. July '37)

Perlas, J. C., Chief Engr., Metropolitan Water Dist., 176 Arroceros, Manila, P.I. (Jan. '40)

Pomona Terra-Cotta Co., Ben C. Sutherland, Salesman, Pomona, N.C. (Assoc. M. Feb. '30)

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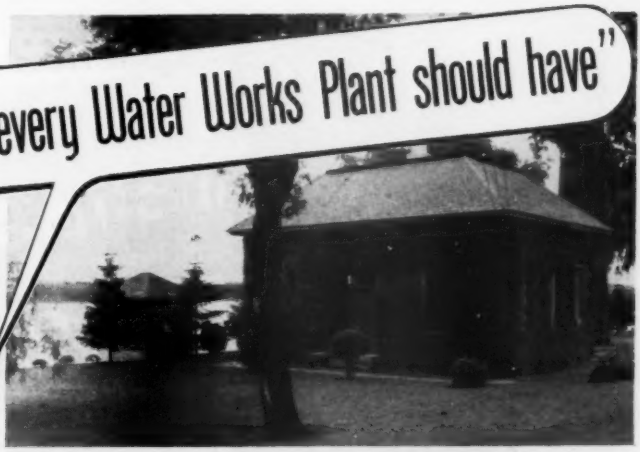

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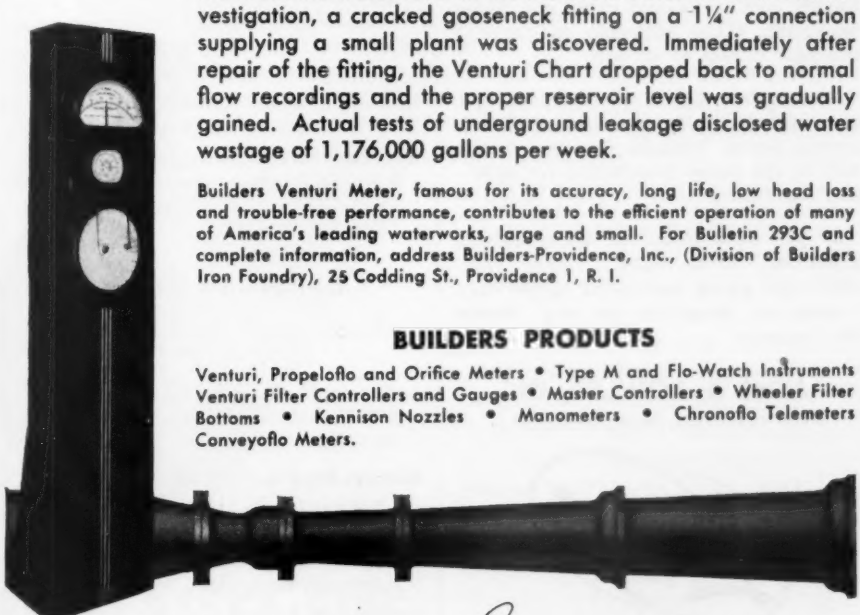

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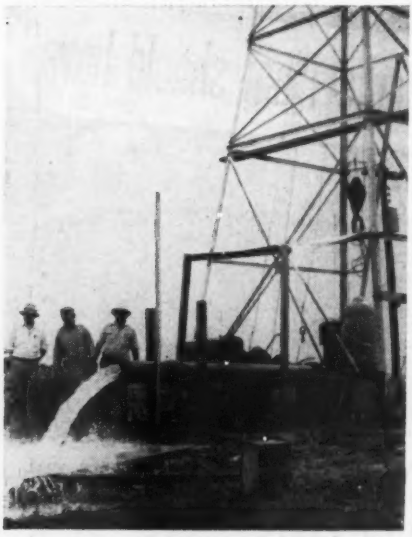

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Shepherd, Ralph, Jr. Assoc. Engr., Bureau of Water Supply, 4636 Rokeby Rd., Baltimore 29, Md. (July '42) *M*

Sutherland, Ben C., *see* Pomona Terra-Cotta Co.

Vrooman, W. S., Water Supply Engr., Southern California Water Co., 1206 S. Maple Ave., Los Angeles 15, Calif. (Sept. '31)

Wagner, Edmund G., Chief of Field Party, Inst. of Inter-American Affairs, Div. of Health & Sanitation, Caracas, Venezuela (May '42)

Wilkins, George F., Eng. Service Div., General Chemical Co., 235 Montgomery St., San Francisco 4, Calif. (Jan. '40)

LOSSES

Deaths

Alexander, Thomas, Supt., Water Dept., City Hall, Kelso, Wash. (May '44)

MacGregor, David, Box 1667, Paterson 16, N.J. (Oct. '43)

Resignations

Drane, Brent S., Prin. Engr., Water Div., Office of War Utilities, War Production Board, 2153 California St., N.W., Washington 8, D.C. (Oct. '43)

Grassie, Charles Andrew, Town Engr., Port Colborne, Ont., Can. (July '41)

Kay, Lawrence A., Director, Public Health Eng., Manitoba Dept. of Health, 320 Sherbrook St., Winnipeg, Man., Can. (Apr. '46) *AMP*

Changes in Address

Changes received between March 5 and April 5, 1947

Anderson, H. W., A B C Construction Co., 810 N. Lakewood Blvd., Hynes, Calif. (Oct. '46)

Bennett, Boyd A., City Mgr., c/o City Hall, Clearwater, Fla. (Jan. '37) *AMP*

Broach, Homer H., Water Engr., U.S. Engrs., Sunflower Ordnance Works, Lawrence, Kan. (Apr. '46)

Couch, L. I., Cons. Engr., 312 E. Washington, Indianapolis 4, Ind. (Jan. '44) *AMP*

(*Continued on page 44*)

Because ARMCO Welded Steel Pipe is available in 50-foot lengths only 106 field joints are needed in a mile of pipeline. This means you save time, labor and money during installation.

Diameters of ARMCO Pipe are 6 to 36 inches; wall thicknesses 7/64 to ½ inch. Special prefabricated fittings can be obtained. Write for complete data. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1785 Curtis Street, Middletown, Ohio.

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Manufacturers of
SODIUM SILICATES

(*Continued from page 42*)

Dominick, Willard H., Mgr., Wichita Meter Supply & Repair Co., 2311 E. 9th St., Wichita, Kan. (Apr. '46)

Friel, Francis S., Pres. & Treas., Albright & Friel, Inc., 1528 Walnut St., Philadelphia 2, Pa. (Mar. '26) *AMP*

Hartmann, F. W., Lt.Col., 5332 N. Hollywood Ave., Milwaukee 11, Wis. (July '25)

Hood, E. J., 1001 Booth St., Houston 9, Tex. (Jan. '44) *MP*

Kirch, L. A., Chief Engr., Indiana Gas & Water Co., Inc., 1630 N. Meridian St., Indianapolis 2, Ind. (Jan. '44) *MP*

Larson, Harry, Lt.Col., Callender, Iowa (Oct. '41) *P*

Maynard, Stuart B., 1605 Miller Rd., R.F.D. No. 3, Ann Arbor, Mich. (July '42)

McKee, Frank J., 1110 Harrison St., Madison 5, Wis. (Jan. '44) *MP*

Miller, S. J., Asst. Chief Engr., Indiana Gas & Water Co., Inc., 1630 N. Meridian St., Indianapolis 2, Ind. (Jan. '37) *M*

Parbury, Charles B., Dist. Mgr., California Water Service Co., 365 B St., San Mateo, Calif. (Apr. '41) *AMP*

Patton, C. S., 32 Tisdale Rd., Scarsdale, N.Y. (May '30)

Picton, Walter L., Office of Housing Expediter, 4-302 Temporary "E" Bldg., Washington 25, D.C. (Apr. '43) *P*

Schlie, Everett H., 2273 Washington St., Dubuque, Iowa (Apr. '42) *P*

Stephens, George William, Jr., 5 McCurdy Ave., Towson 4, Md. (July '42)

Taylor, Floyd B., S.A. San. Engr. (R), U.S. Public Health Service, 15 Pine St., New York, N.Y. (July '39)

Van Reenen, W. J., Sales Mgr., American Norit Co., Inc., 707 Atlantic National Bank Bldg., Jacksonville 1, Fla. (Jan. '39) *P*

Vaseen, V. A., San. Engr., 2540 Yates St., Denver 12, Colo. (Jan. '44) *P*

Waters, Leslie W., Asst. Civ. Engr., New York City Board of Water Supply, 127 Broadway, Newburgh, N.Y. (July '46) *AMP*

Wieghart, George F., Chief Engr., Hackensack Water Co., 1337 Dickinson Rd., West Englewood, N.J. (Mar. '24) *AMP*

Products for Treatment of Water, Sewage, and Industrial Wastes

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTH (Min.)	SHIPPING CONTAINERS	APPLICATIONS
Sodium Sulfate, Crystal $Na_2SO_4 \cdot 10H_2O$ (*Glauber's Salt*)	Crystal & Needle Cryst.	96% $Na_2SO_4 \cdot 10H_2O$	Barrels Bags Drums	Neutral Solution. Boiler water treatment (maintenance of sulfate-carbonate ratio).
Sodium Sulfate, Anhydrous Na_2SO_4	Powdered	99.5% Na_2SO_4	Bags Barrels	Neutral Solution. Boiler water treatment (maintenance of sulfate-carbonate ratio).
Trisodium Phosphate $Na_3PO_4 \cdot 12H_2O$ (*TSP*)	Crystal	98.5–103% $Na_3PO_4 \cdot 12H_2O$ (Equiv. 19% P_2O_5)	Bags Barrels Fibre Drums	Boiler water treatment. Cleaning compound. 1% Sol. pH 11.8-12.0.
Disodium Phosphate, Crystal $Na_2HPO_4 \cdot 12H_2O$	Crystal	98% $Na_2HPO_4 \cdot 12H_2O$ (Equiv. 19.5% P_2O_5)	Bags Barrels Fibre Drums	Boiler water. (Calcium and magnesium precipitation.) 1% Sol. pH 8.4.
Disodium Phosphate, Anhydrous Na_2HPO_4	Powdered Flake	96% Na_2HPO_4 (Equiv. 48% P_2O_5)	Bags Barrels Fibre Drums	Same as Crystal, but stronger product.
Sodium Fluoride NaF (*Fluoride*)	Powdered (white or blue colored: Nile Blue) Light or dense	90% and 95% NaF	Bags Barrels Fibre Drums	Fluorination of water supplies. (For information, consult with local and state health officials.)

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In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited
Montreal • Toronto • Vancouver

(*Continued from page 22*)

MINNESOTA SECTION MEETING

With total registration reaching a record 206, the Minnesota Section held its 31st Annual Conference in St. Paul on March 13–14. The South Dakota members, who were enrolled in the section as of Feb. 1, 1947, met with the group for the first time. Membership in the section now stands at 161, a gain of 28 over a year ago.

First item of business was a report that the section had voted to become affiliated with the Minnesota Federation of Engineering Societies. This move will give all section members the benefits of membership in the Federation, to which only a few had belonged previously.

D. B. Morris, Pres., Lyon Chemicals, Inc., St. Paul, presided over the opening session of reports and technical papers. Satisfactory progress on "Unaccounted-for Water" was reported by Chairman O. E. Brownell of the Research and Advisory Com. W. N. Venables, San. Engr., Health Dept., Winnipeg, Man., spoke on "Public Health and the Water Works," a subject that was further discussed by W. W. Towne, Director, Div. of San. Eng., State Board of Health, Pierre, S.D.

With William D. Hurst, City Engr., Winnipeg, Man., presiding, the afternoon session of technical papers was opened. "The Design, Operation and Maintenance of Deep Wells" was the subject of a paper by Lee Rogers, Pres., Layne-Western Co. of Minnesota, Minneapolis; and was discussed by C. R. Podas, Assoc. Engr., Pfeifer & Shultz, Minneapolis. "Are You Prepared for a Catastrophe?" was the subject of one panel discussion and "What the New U.S. Public Health Service Standards Mean to You" the topic of another. Both panels elicited lively discussion from the floor, indicative of a general interest in the subjects presented.

The morning session of the second day was presided over by Jerome H. Svore, Director, Div. of San. Eng., North Dakota. "Municipal Water Works Organizations," a review of the national committee report, was presented by H. S. Grove, Gen. Mgr., Board of Water Comrs., Stillwater. A panel discussion on the importance of good records for efficient operation and a paper on "The Removal of Iron and Manganese" by Everett R. Mathews, San. Chemist, Div. of San. Eng., State Board of Health, South Dakota, were also presented.

At the business luncheon, A.W.W.A. President Wendell R. LaDue gave the principal address, on the "Progress Made by Water Works Operators in the United States and Canada."

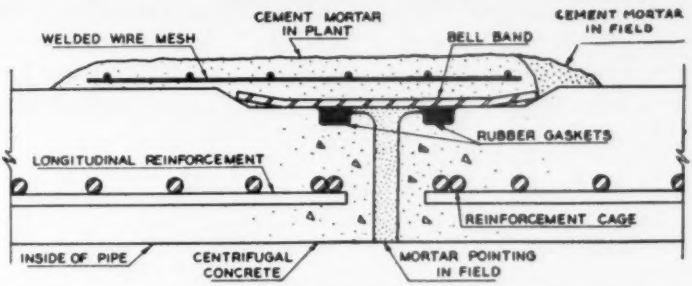
The concluding session, presided over by Arthur F. Mellen, Supt., Columbia Heights Filtration Plant, Minneapolis, featured the annual "Battle Royal" in which the "Twin Cities Slickers" opposed a collection of "Country Gentlemen." As always, this program attracted great interest,

(*Continued on page 50*)

ANOTHER SIGNIFICANT DEVELOPMENT BY

American
PIPE & CONSTRUCTION CO.
LONG-LASTING WATER SUPPLY LINES

HUME CENTRIFUGAL CONCRETE PRESSURE PIPE WITH DOUBLE RUBBER GASKET JOINT....



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This simple, accurately-fitting joint provides ample flexibility, and is another example of ingenuity and engineering skill in the development of better products for water supply lines. Write for descriptive literature.

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Specializing in the manufacture and installation of American Concrete Cylinder Pipe, Lock-Joint Concrete Cylinder Pipe, Pre-stressed Lock-Joint Concrete Cylinder Pipe, Hume Centrifugal Concrete Pressure Pipe.

(*Continued from page 48*)

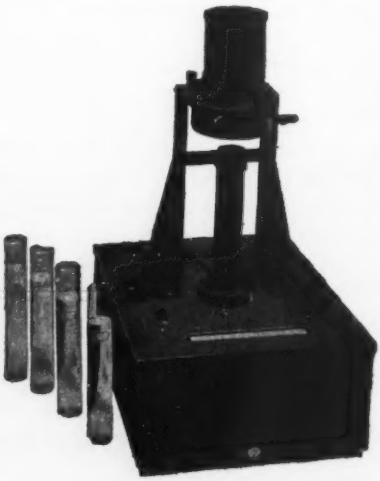
and, despite the occasional hilarity, those present derived much benefit from the serious content under discussion. "Public Relations" was the topic for a panel discussion by Leonard N. Thompson, Gen. Mgr., Water Dept., St. Paul, Edgar W. Johnson, Water Works Engr., Minneapolis, and Milton Rosen, Comr. of Public Works, St. Paul.

Closing the technical program were the following papers: "The Application of Chlorine Dioxide to Potable Water Supplies" by R. N. Aston, Mathieson Alkali Works, New York; and "Fluoride Treatment of a Public Water Supply" by W. A. Jordan, Director, Div. of Dental Health, Minnesota Dept. of Health.

At the banquet, in addition to the usual entertainment and business functions, R. R. Price, Prof. of Eng., Univ. of Minnesota, gave an excellent talk on "Technical and Practical Educations." The meeting ended with a feeling that it had been entirely satisfactory, and that there had been sufficient merit and variation in the technical papers and reports to interest all attending.

R. M. FINCH
Secretary-Treasurer

(*Continued on page 52*)



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A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

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(*Continued from page 50*)

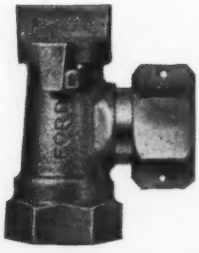
Liquid Conditioning Corp., Linden, N.J., has issued a new bulletin outlining concisely the applications, principles of operation and equipment used in sodium and hydrogen zeolite water softeners and demineralizers. Illustrated by flow diagrams and drawings showing the design of the company's equipment, the bulletin also describes the various types of cation exchange materials produced under the trade name "Liquonex." Copies may be obtained by writing to the company's main office and plant now located at 114 E. Price St., Linden, N.J., requesting Bulletin 5.

Simplex Valve & Meter Co., Philadelphia, recently issued an interesting bulletin containing complete data on the use of air inlet valves, including all facts needed to put such valves into use as protection against collapse of thin-walled gravity flow pipelines. These data are presented in the form of accurate nomographs to replace the lengthy formula calculations previously required. Copies may be obtained by writing to the company office at 6784 Upland St., Philadelphia 42, requesting Bulletin No. 125.

Other recent bulletins issued by the company are: No. 450 on "Type TG Insert Venturi Tubes and Nozzles"; No. 210 on "Type S Parabolic Flumes"; and No. 140 on "Air Release Valves."

(*Continued on page 54*)

Ringstyle



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Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.

If your tanks and steel structures are not now protected by this proven low cost method, they should be. No obligation. Send for fully descriptive literature today.

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TURBIDIMETER

A TURBIDIMETER WITHOUT STANDARDS

The Hellige Turbidimeter is based on the comparison of a beam of light with the Tyndall effect produced from the lateral illumination of the specimen by the same light source. It is the only instrument of its kind which does not require any standard suspensions and which is unaffected by fluctuations in the line voltage. ACCURATE, FOOLPROOF and UNIVERSAL, this precise instrument is not only ideal for turbidity and sulfate determinations of water, but for measurements of any suspended matter in general. Turbidity measurements can be made down to zero-turbid water.

Those who are familiar with the cumbersome long tubes of older apparatus and the inconvenience encountered with older methods, will appreciate the handy, short tubes of the Hellige Turbidimeter and the many other features which enhance accuracy, speed and reliability.

WRITE FOR BULLETIN No. 602(T) which also describes Hellige Comparators employing Permanent Glass Color Standards for pH control and all popular water tests based on A.P.H.A. and A.W.W.A. methods.

HELLIGE
INCORPORATED
3718 NORTHERN BLVD., LONG ISLAND CITY 1, N.Y.

(*Continued from page 52*)

The American Water Works & Electric Co., Inc., announced the election of Gilbert W. Chapman, Vice-Pres., to the position of President of the American Water Works Co. as of March 24. Action was taken pursuant to the plant for segregation of the system's water companies from its other utility holdings.

Builders Iron Foundry, Province, R.I., has named George W. Kelsey, Gen. Sales Mgr. and member of the Board of Directors, to vice-presidency of the concern. Kelsey, who joined Builders in 1938 from the U.S. Steel Corp., is also Vice-Pres. of Builders-Providence, Inc., and Builders-Pacific, Inc., as well as Secy. of the Omega Machine Co.

The Mathieson Alkali Works, Inc., has announced the following appointments in its Specialties Div.: C. R. Whittington, Asst. Mgr.; Lawrence Eller, Sales Repr. for Delaware, Maryland, District of Columbia and parts of New Jersey and Pennsylvania; and H. Desmond Watson, Sales Repr. for Ohio, West Virginia and part of Kentucky. Whittington, who formerly held the position of head of the calcium hypochlorite department, will now supervise field work on specialty products, including bleach, special detergents and sanitation chemials, as well as engage in the department's sales promotion activities.

Byron Jackson Co., Los Angeles, has prepared a new twelve-page bulletin giving details on its "Hydropress Pump." Included are technical data, application pictures, cross-section drawings of parts, operation and design features, dimensional sketches and assembly procedure for pumps of 10-, 12- and 15-in. sizes, with capacities of 20 to 300 gpm. and head range 55 to 250 ft. per stage (to pressures of 5,000 psi.). Copies may be obtained by writing to the company at Box 2017 Terminal Annex, Los Angeles 54, requesting Bulletin No. 46–6000.

(*Continued on page 58*)

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of any other pressure pipe material, practicable for underground mains, that will serve for a century?

Serves for Centuries

(*Continued from page 54*)

KANSAS SECTION MEETING

On March 13 and 14, Wichita was host to the members of the Kansas Section, who held their second annual meeting there in conjunction with the convention of the Kansas Sewage Works Association. A total of 132 members and guests registered for the technical sessions, giving the new section organization full support.

Special messages to the delegates from the parent associations were delivered by A.W.W.A. President-elect N. T. Veatch, F.S.W.A. Vice-President George S. Russell and Kansas Section Director F. A. Russell to open the meeting. And throughout the two days, inspection tours through the Wichita Water Co. and the city sewage treatment plants were conducted by local members.

First address on the technical program was a discussion on water rates by A. P. Learned, Cons. Engr., Black & Veatch, Kansas City, Mo., who directed his attention particularly at the effects of the rising price index on water costs. The work of the A.W.W.A. Committee on Water Works Organization was then discussed by R. S. Millar, Mgr., Wichita Water Co., and by Major C. Hagar, Water Supt., Lawrence. Upon completion of the latter report, the members of the section voted to support the study, electing E. J. Allison, City Mgr., Salina, to represent it on the committee.

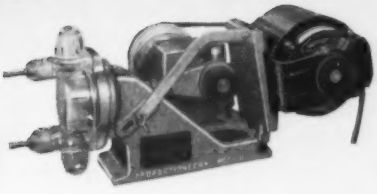
The second session of the program was opened by V. C. Fishel, Engr., Div. of Ground Water, U.S. Geological Survey, who spoke on "Ground Water Resources of Kansas," giving a review of Kansas geology and its relation to present ground water supplies. R. V. Smrha, Sr. Engr., Div. of Water Resources, State Board of Agriculture, then presented a paper on "A State Plan of Water Resources Development in the Neosho River Basin," in which he discussed the surveys made and the various flood control and development plans for the basin, together with their relation to stream pollution problems. The subject of water resources was further covered by D. R. Soder, Layne-Western Co., Wichita, whose paper "Operation and Maintenance of Wells" gave a general review of the difficulties of tapping the ground water basins and making the water available for use.

Closing the afternoon session was a panel discussion on "Public Relations," led by R. S. Millar, in which E. L. Filby, Cons. Engr., Black & Veatch, H. H. Kansteiner, Leavenworth Water Dept., and Alar Mawdsley, Water Supt., Pratt, also participated. In addition to the formal discussion, considerable comment was made by members of the audience, evidencing a live interest in the subject.

The final technical session was introduced by a showing of the film "Clean Waters." P. J. Dominick, Supt., Meter Dept., Wichita Water Co., then spoke on "Sizing of Water Meters," covering both theoretical and practical considerations in selecting proper meters for a given installation.

(*Continued on page 60*)

AT LAST!



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or have our representative call at your plant.

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(*Continued from page 58*)

Following a period of open discussion, C. A. Hunter, Director, Div. of Public Health Labs., Topeka, gave a general review of the "Bacteriology of Drinking Water," pointing out the various requirements of proper sampling and analysis.

The session ended with a panel discussion on "Water Works Administration," led by E. J. Allison. Participating also were N. T. Veatch, Cons. Engr., Black & Veatch, R. V. Gilcrest, Supt. of Utilities, Wellington, and Major C. Hagar, Lawrence.

Following the business meetings on the afternoon of March 14, a number of section members remained to participate in the panel discussion on "Sewage Disposal Problems," sponsored by the members of the Kansas Sewage Works Association.

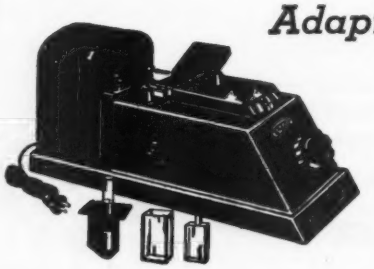
Entertainment was provided at the annual banquet held on the evening of March 13 at the Broadview Hotel. R. S. Millar acted as toastmaster, and speaker of the evening was Payne Ratner, former governor of the state, who delighted those in attendance by his stories of pertinent incidents drawn from his experience as a state official.

MAJOR C. HAGAR
Secretary-Treasurer

(*Continued on page 62*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

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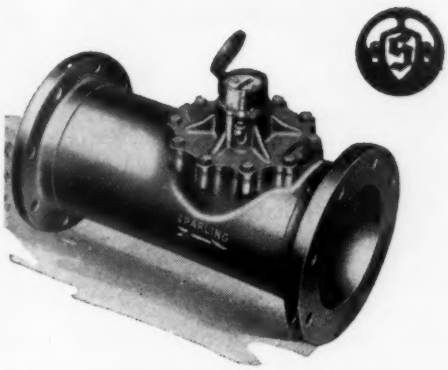

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Can You Account for 90% of Your Output?

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Sparling Main-Line Meters have been giving Service and Satisfaction for over 27 years. They will serve you on pump, reservoir, treatment and distribution lines.

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622 Broadway.....CINCINNATI 2
101 Park Avenue .....NEW YORK 17
BOSTON 8.....6 Beacon Street

(*Continued from page 60*)

Albright & Friel, Inc., Philadelphia consulting engineering firm, recently announced the removal of its offices to Suite 816–822, 1528 Walnut St., Philadelphia 2.

Wheelco Instruments Co., Chicago, has just issued a new condensed catalog describing its electronic control and measuring devices. Illustrated profusely with graphs, diagrams and photographs, the bulletin contains full listings and specifications on Wheelco instruments. Copies of the catalog may be obtained by writing to the company office at 847 W. Harrison St., Chicago, requesting Bulletin 3–6400.

Dresser Mfg. Div., Bradford, Pa., has issued a new catalog containing a full description of every Dresser product. A novel feature of the 106-page bulletin is a visual index, conveniently placed in the front of the book, illustrating 36 principal pipe joining and repair products together with brief descriptions of their uses and the page numbers on which details can be found. Requests for copies should be made on business letterhead, specifying Catalog No. 47.

(*Continued on page 64*)

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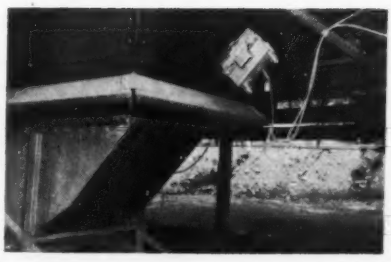
Write for Folder 1-44, or send us a dimensional sketch, giving gauge of hopper walls, etc.



SYNTRON CO.

428 Lexington Homer City, Pa.

IT'S EASY *if* YOU KNOW-HOW

Now is the time to put your mains in condition for handling peak summer loads.

We have the men, the experience and the equipment necessary to handle any pipe cleaning job quickly, effectively and economically.

Why not ask us for an estimate.

National Know-How Pays

NATIONAL WATER MAIN CLEANING COMPANY

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ATLANTA.....1221 Mortgage Guarantee Building
BOSTON.....115 Peterboro Street
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OMAHA.....3812 Castellar Street
RICHMOND.....210 East Franklin Street
ST. LOUIS.....7103 Dale Avenue
SALT LAKE CITY....149-151 W. Second South Street
SAN FRANCISCO.....681 Market Street
MONTREAL.....2028 Union Avenue
WACO.....P. O. Box 887
WINNIPEG.....576 Wall Street
HAVANA · MAYAGUEZ, PUERTO RICO · BOGOTA · CARACAS · MEXICO CITY

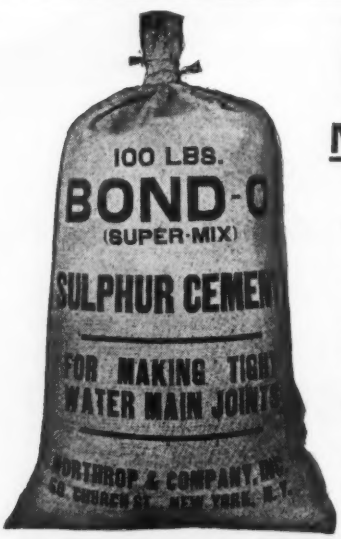
(*Continued from page 62*)

Liquid Conditioning Corp., Linden, N.J., recently issued a condensed catalog of its purification and treatment equipment and materials. The eight-page booklet is illustrated by diagrams showing the principles of design and operation of representative types of equipment and by tabulations of the various impurities found in water, their effects, limits of tolerance and methods of removal. A particularly interesting chart is one showing the results of treating a single water by six different conditioning methods.

The American Society for Metals has announced the early publication of its *1947 Metals Handbook,* first edition to be published since 1939. Included in the book are to be 17 articles prepared by a committee of metal producers and users who have been actively at work on their preparation since 1940. These articles will summarize heat treatments recommended for the tool steels used in industry, discussing the 50 principal types of special steels employed.

When completed the book will be distributed to the Society's 21,000 members throughout the U.S., Canada, Europe and Asia and to the various domestic and foreign research and educational institutions which have made it a standard reference book.

(*Continued on page 66*)



MACHINE BLENDED

BOND-O users know that our method of machine-blending is decidedly worth while. This method produces a self-caulking joint compound which is denser in structure, with less shrinkage and practically no initial seepage. Because of the wide distribution of all the minerals, any slight seepage takes up unusually fast. Compare—and you will see the difference.

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1879—ROSS—1879

Automatic Valves

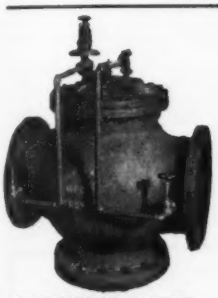
ALTITUDE VALVE

Controls elevation of water in tanks, basins and reservoirs

1. Single Acting
2. Double Acting

Maintains safe operating pressures for conduits, distribution and pump discharge

SURGE-RELIEF VALVE



REDUCING VALVE

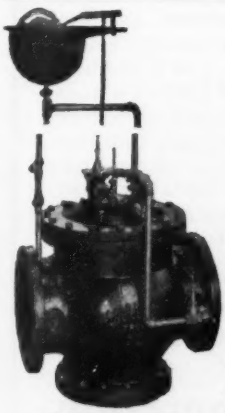
Maintains desired discharge pressure regardless of change in rate of flow

Regulates pressure in gravity and pump systems; between reservoirs and zones of different pressures, etc.

A self contained unit with three or more automatic controls

COMBINATION VALVE

Combination automatic control both directions through the valve.

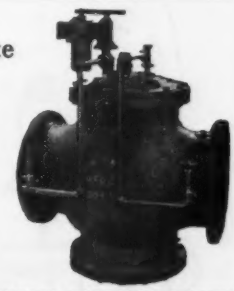


FLOAT VALVE

Maintains levels in tank, reservoir or basin

1. As direct acting
2. Pilot operated and with float traveling between two stops, for upper and lower limit of water elevation.

Electric remote control—solenoid or motor can be furnished



REMOTE CONTROL VALVE

Adapted for use as primary or secondary control on any of the hydraulically controlled or operated valves.

Packing Replacements for all Ross Valves Through Top of Valve

ROSS VALVE MFG. CO., INC., P. O. BOX 593, TROY, N. Y.

(*Continued from page 64*)

Clarksburg, W.Va., voters recently re-elected Glenn B. Tinsley to the city water board for another six-year term. In anouncing the results of the election, Scotland G. Highland, Secy. & Gen. Mgr. of the board, forwarded evidence of a rather "enlightened" political campaign for the office, including a three-column newspaper advertisement which reviewed the history and importance of the board itself and emphasized the wartime contributions made during Tinsley's previous term of office. So long as politics must enter into the water works picture, it is refreshing to witness the success of constructive campaign tactics.

Electro Rust-Proofing Corp., Belleville, N.J., has announced the appointment of Frank P. Macdonald as Sales Manager of the firm, with headquarters in Chicago. The appointment is part of the company's plan to expand applications of cathodic protection throughout the water works field.

If it's news, send it in. Let your fellow water works men in on the latest scoop in your corner of the field. Having no reporters, the JOURNAL must depend upon its readers' contributions. A pencilled note on a penny postcard will suffice to get your story into print.

On Call . . .
to tell your story for you!

Willing Water wants work on or as your public relations staff. Let him be your spokesman to your customers . . . to your personnel. You'll find him a master of the art of putting across your ideas... of soliciting co-operation ... of establishing good will. Call him up... put him to work on your publicity, your signs, your bulletins, your bills, your reports... you'll find him ready, able and, of course, willing.

Low-cost blocked electrotypes or newspaper mats, in 32 different poses, are immediately available to you. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
500 Fifth Avenue • New York 18, New York

NEWS OF THE FIELD

What has happened to our Postwar Construction Program? This is the question which today faces industry and governmental agencies as well as water works along with all other public works.

Plans are ready or at the estimate stage for more than three billion dollars' worth of water, sewage and other sanitation works. Why are they not going forward? The simplest answer is that engineers and executives are not willing to commit themselves to contracts under present price and supply conditions, unless the need for construction is imperative and the work cannot in the public interest be postponed. Present day construction contracts are priced at nearly 200 per cent of 1939 costs. Municipal engineers are not willing to assume that this price level is other than transitory, although Louis Howson almost a year ago warned that we should not expect postwar construction costs to drop much under 150 per cent of prewar levels.

Another factor which plagues every job now in progress is the time lag on materials. In a survey initiated by the A.W.W.A. and still in progress, it is being shown that a six months' to two years' wait is required to obtain some water works materials. The current recession in the housing field may serve to reduce the pressure on water works to extend service and at the same time permit manufacturers to catch up on orders.

More than half a billion dollars went up in smoke in 1946, when the nation's fire losses totaled $561,487,000, second highest loss in U.S. history, and only $500,000 short of the all-time high of 1926—higher, incidentally, than the year of America's worst conflagration, the San Francisco fire of 1906. And now 1947 is well on its way to establishing a new record. Fire losses for January of this year, according to National Board of Fire Underwriters' reports, were the highest on record, $57,180,000, almost 15 per cent above the 1946 January total. Add to that the tremendous destruction involved in the recent Texas City holocaust and the estimate assumes fantastic proportions.

The direct per capita loss in 1946 was $4.01, representing approximately $10 per wage earner. The indirect losses involved in loss of jobs, impairment of credit, business failures, cost of fire fighting and waste of resources will at least double that total. Even a nation as rich in resources as the United States—even a people as well provided with the necessities as its citizens—cannot long afford so appalling a waste.

What will result from the deliberations of the National Conference on Fire Prevention, held last month at the instance of President Truman, remains to be seen. But fundamentally it will not be through deliberations

(Continued on page 2)

(*Continued from page 1*)

nor through conferences that the problem will be solved. Only a concerted attack upon the roots of matter can be really effectual. Only if every plant, every office and every individual will act now and continue to act to reduce the fire hazard in its own environment can fires be prevented.

Insofar as fires can thus be prevented, the water works man has a duty to perform in co-operating with these efforts, not only in his own plant and home, but in facilitating the installation of protective devices. But his duty does not end there—it must extend too to his co-operation with the local fire departments in reducing the loss occasioned by the fires which could not be or were not prevented. If he has not already done so, he should immediately establish close liaison with the fire department officials of his community with a view toward assuring maximum co-ordination of their efforts in fighting fires. No single individual is in a better position to perform a real service in the reduction of fire waste.

Frank A. Barbour, Cons. Hydr. & San. Engr. of Boston, died suddenly at his Framingham home on May 24. A member of the A.W.W.A. for 41 years and an Honorary Member since 1939, Barbour served as President of the Association in 1936 and on its Board of Directors from 1932 to 1937. A detailed account of his professional accomplishments will be carried in the next issue of the JOURNAL.

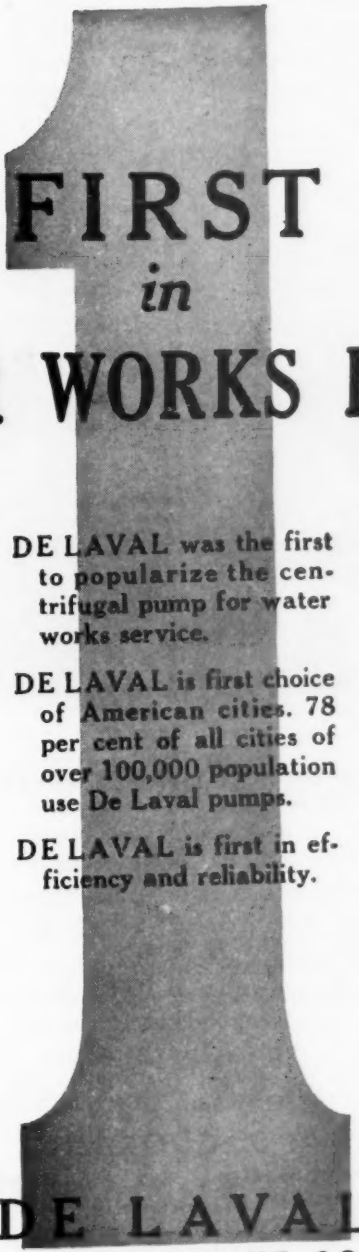
A sealed air chamber to reduce the pressure wave of water inside a fire hose when it is shut off at the nozzle, thus protecting firemen and property from the consequences of bursting hoses, has been developed by Lewis H. Kessler, Prof. of San. Eng., and Merrill B. Gamet, Assoc. Prof. of Civ. Eng., at the Northwestern Univ. Technological Institute. In other applications, the device will also eliminate vibrations and knocks heard in home and apartment plumbing systems when faucets are turned off, reduce damaging vibrations caused by fast-closing valves in commercial bottling equipment, and improve the efficiency of automatic sprinkling systems.

The chamber is a metal cylinder about 1 ft. in diameter and from 9 to 18 in. high, which is connected to the fire truck pump or, in plumbing systems, to the pipe near the faucet or valve. Inside the chamber, a bellows in a pocket of compressed air is filled with water forced in from the hose or pipe. When nozzle or valve is closed, the pressure wave rushes into the bellows and is cushioned by the compressed air.

In tests the device reduced pressure from 1,125 to 175 psi. when water pumped at a rate of 200 gpm. through a 2-in. pipe 85 ft. long was stopped by a fast-closing valve. Fatigue tests, subjecting the chamber to 280,000 valve closures, or 18 closures per minute continuously for ten days, have already shown that the chamber will outlast any part of the pipe or hose system to which it is attached. The fatigue experiment is to be continued until 1,000,000 closures are completed.

(*Continued on page 4*)

DE LAVAL



FIRST *in* WATER WORKS PUMPS

DE LAVAL was the first to popularize the centrifugal pump for water works service.

DE LAVAL is first choice of American cities. 78 per cent of all cities of over 100,000 population use De Laval pumps.

DE LAVAL is first in efficiency and reliability.

DE LAVAL
STEAM TURBINE CO.
TRENTON 2, NEW JERSEY

WW-2

(*Continued from page 2*)

The Korean Water Works Association became an actuality on April 3 and 4, when 70 charter members from eight provinces assembled in Seoul, under the auspices of the U.S. Army Dept. of Public Works, to elect officers and organize its activities. Under the leadership of Kim Hyong Min, Mayor of Seoul, elected first president of the organization, a number of committees were appointed and national standards of water works practice adopted. Co-ordination of water supply activities throughout the country is to be fostered by the submission of monthly reports by each of the newly designated committees.

Members of the Korean Water Works Association in Convention at Seoul, Korea, Hearing the Inaugural Address of First President Kim Hyong Min; American representative S. J. Shank is seated below the center of the blackboard with his interpreter at his left

Lone American representative at the meeting was S. J. Shank, civilian employee of the Army who acts as Chief Adviser in National Public Works for the Military Government City Planning Bureau. Shank, who was Supt. of the Escanaba, Mich., Water Dept. before the war, replaced A.W.W.A. member Major Anson B. DeWolf in that position when the latter returned to the U.S. some months ago.

(*Continued on page 6*)

GENUINE COOK WELL STRAINERS
REG. U. S. PAT. OFF.

A. D. COOK, INC.
Lawrenceburg • Indiana
Manufacturers of
Vertical Turbine Pumps, 10 to 10,000 gpm.
Well Strainers, 2 to 40 in.
Water Systems; Shallow Well, Deep Well and Ejector
Write for Sales Literature

DEEP WELL COOK PUMPS
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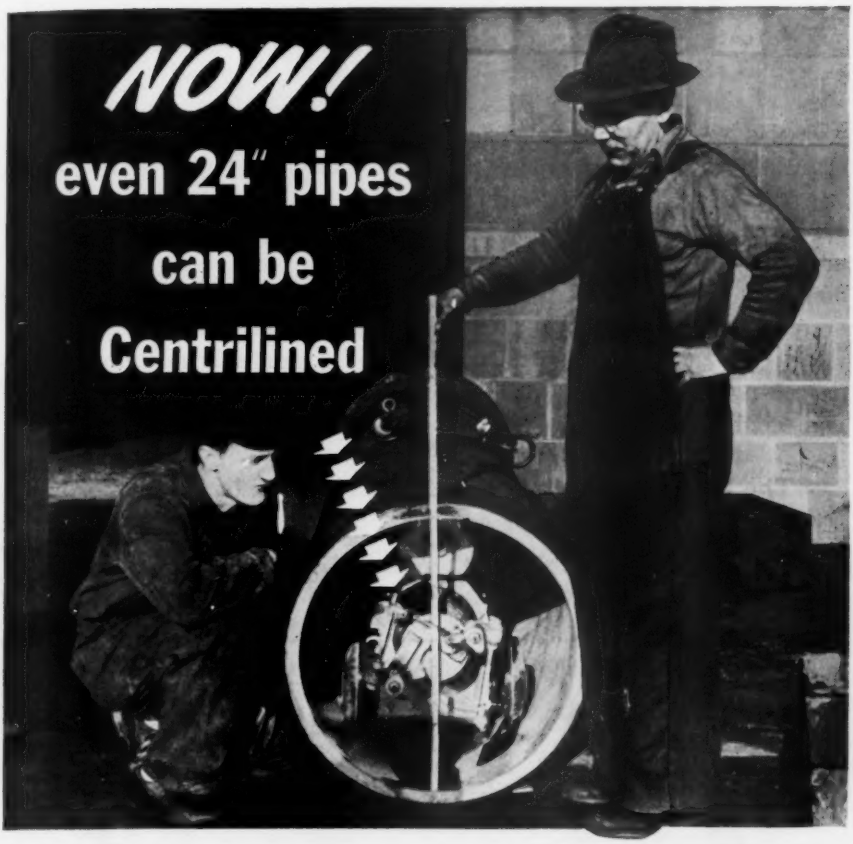


UNDERGROUND . . . AND IN PLACE

Centriline's recent developments in the technique of applying cement-mortar lining now make possible the centrifugal process for pipes as small as 24" in diameter.

The Centriline process is applied with the same skill and with the same dependable results on 24" pipe as on pipes of much larger diameter. Centrilining consists of first cleaning the main and applying by centrifugal force, a cement-mortar lining of required thickness without rebound. This dense, quality product is mechanically troweled to a smooth finish. This new coating permanently resists tuberculation and corrosion.

★ ★ ★

Restore and maintain high carrying capacity now by Centrilining all pipe-lines of 24" diameter or more.

CENTRILINE CORPORATION

142 CEDAR STREET • NEW YORK 6, N. Y.

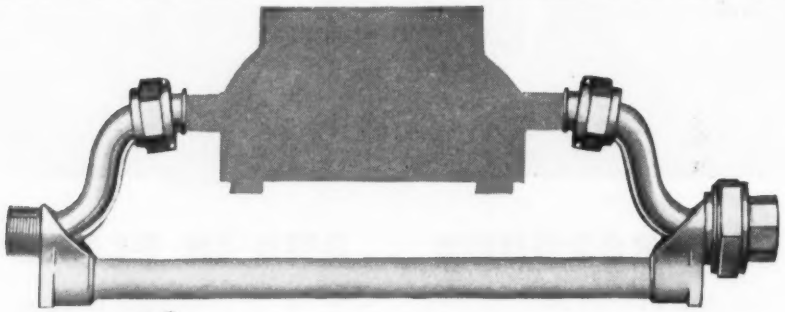
Restores and Protects Pipe-Line Carrying Capacity

(*Continued from page 4*)

A roster of all Sanitary Corps officers, including those separated as well as those still on active duty, is now being prepared by Col. M. J. Blew of the National Society of Professional Engineers in conjunction with the preparation of an analysis and evaluation of the activities and contributions of the corps during the war. In view of the fact that existing records are inaccurate and incomplete, all officers and former officers are asked to communicate with Col. Blew at the Society office, 1359 Connecticut Ave., N.W., Washington 6, D.C., submitting the following information: (1) date and rank when called to active duty; (2) present rank or rank on separation; (3) civilian specialty; (4) a resume of pertinent facts regarding active duty assignments; (5) academic and professional degrees; (6) professional and honorary society affiliations; (7) whether registered or certified, etc.; and (8) any comments or suggestions.

The Virginia Conservation Commission Div. of Water Resources & Power recently issued four additional bulletins in its series of reports on the "Surface Water Supply of Virginia," providing a compilation of stream flow records on the following river basins: Bul. 4—Potomac,

(*Continued on page 8*)



SAVE TIME AND TROUBLE

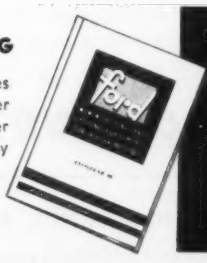
...with This Permanent Meter Setter!

Ford Linesetters save many expensive delays by establishing a permanently aligned spacing for water meters. Also serve as electrical bond around meter. Made in plain and valve types for basement or outdoor settings. Start saving meter changing costs *now*, with Ford Linesetters.

FREE CATALOG

New Ford catalog describes Linesetters and many other time saving devices for water utilities. Send for your copy today.

FORD METER BOX CO.
WABASH, INDIANA



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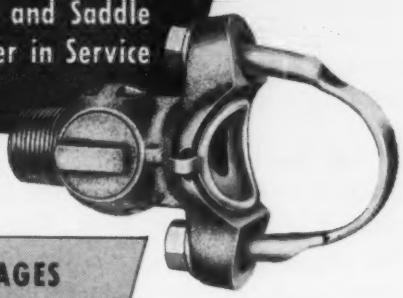
LINESETTERS

It's New . . .

HAYS "DUO-STOP"

A Combination Corporation Stop and Saddle
That's Simpler to Apply, Stronger in Service



PATENT APPLIED FOR

NINE IMPORTANT ADVANTAGES of the New HAYS "DUO-STOP" and Pipe Saddle

- The new Hays "Duo-Stop" makes possible a quick, simple, and safe installation of corporation stops on small mains of 2" size, where the small diameter and the thin wall make it impractical to tap the main.
- The "Duo-Stop" is strapped securely and permanently to the main, the stop is opened, and the hole is drilled, by a drilling machine inserting the drill through the stop.
- The installation may be made while the main is under water pressure - - Thus no shutdown of service.
- There is no threaded connection in the Pipe Saddle Shut-Off; stop and service clamp are one piece, solid rust-proof bronze, pressure tight and leakless.
- The extra strength, secured by one-piece construction and reinforced ribbed design, prevents distortion due to strain of strapping, or of outside stresses, and assures perfect functioning.
- The lead gasket provides a tolerance that guarantees a tight fit on either cast iron or steel service mains.
- The 2" "Duo-Stop" Saddle is designed for use on either 2" cast iron or steel pipe. The 2¼" "Duo-Stop" Saddle is designed for use on either 2¼" cast iron or 2½" steel pipe.
- The fact that service clamp and stop are cast in one piece simplifies purchasing and stock-keeping. Eliminates necessity of purchasing as separate items.
- Outlets for all types of services.

Write for Folder 105

HAYS COPPER BRASS LEAD IRON
WATER WORKS PRODUCTS
HAYS MANUFACTURING CO., ERIE, PA.

(*Continued from page 6*)

Rappahannock and York; Bul. 5—James; Bul. 6—Chowan and Roanoke; and Bul. 7—New, Big Sandy and Tennessee. The data presented in these bulletins were obtained in an investigation of stream flow from Oct. 1, 1927, to Sept. 30, 1942, made by the division in co-operation with the Water Resources Branch of the U.S. Geological Survey. Providing complete information on the streams of the state for a 15-year period which included record-breaking floods and droughts, the reports are expected to serve as a useful and convenient reference for engineers and as a basis for future development and control programs.

A fluoride survey of 50 selected public water systems in West Virginia is now being conducted by the State Health Dept. with the assistance of A. R. Todd, Supt., Wheeling Filtration Plant, who will perform the required analyses. Of the first fifteen samples collected by health department personnel, it is reported that two have shown appreciable amounts of fluoride, but no definite information is to be released until the survey has been completed.

The Sanitation Research Project of the Assn. of American Railroads' Joint Com. on Railway Sanitation has issued a bulletin entitled "An Inquiry Into the Public Health Hazard of Sewage Disposal From Railway Conveyances," prepared by Dr. Kenneth F. Maxcy as the second technical report of the project. In line with the project's objective of developing a satisfactory sanitary method of handling the sewage wastes from passenger-carrying railway cars, this report reviews the evidence of health hazards traceable to present methods of disposal, during the period from 1900 to 1945. An abstract of the data included will be printed in the next issue of this JOURNAL. Copies of the original document are available from the Joint Committee Secretary at 30 Vesey St., New York 7, at a cost of 75¢ per copy.

(*Continued on page 10*)

NATIONALLY APPROVED APPLICATORS OF ANTI-RUST AND ANTI-CORROSIVE COATINGS FOR ELEVATED TANKS, STAND PIPES, PENT STOCKS AND OTHER WATER WORKS INSTALLATIONS. **NO-OX-ID, BARRETT'S** AND OTHER APPROVED PROTECTIVE COATINGS APPLIED BY EXPERTLY TRAINED MEN.

W. A. BRIGGS BITUMEN Co.

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The Last Word in Chemical Feeders

OMEGA—Chemical Feeder Specialists—builders of a complete line of Gravimetric, Volumetric and Solution Feeders for every waterworks application.

MATERIALS both dry and in solution are handled: lime, soda ash, activated carbon, alum, sulfates, Ferrisul, Ferri-Floc, hypochlorite, etc.

EXCEPTIONAL feeding range is covered by the line: dry feeders from 0 to 10,000 lbs. per hour; solution feeders from 0 to 800 gals. per hour.

GUESS WORK is eliminated—feeding performance can be relied upon—with OMEGA you *know* the correct amount of chemical is being fed.

ALL OMEGA feeders are simple in design, trouble-free, and proven in service. They are the answer to your feeding problem and will save you money.

OMEGA PRODUCTS

GRAVIMETRIC FEEDERS
Loss in Weight Type, Bulletin 20-23
Belt Type, Bulletin 24-27

VOLUMETRIC FEEDERS
Universal Feeder, Bulletin 1-4
Disc Feeder, Bulletin 18-21
Rotolock Feeder, Bulletin 50-52
Precision Solution Feeders, Bulletin 9-12
Rotodip Solution Feeder, Bulletin 46-49

LIME SLAKERS, Bulletin 5-8

DUST REMOVERS AND FILTERS, Bulletin 42-45

LABORATORY STIRRERS, Bulletin 13-14

Send for Bulletins and complete information.

OMEGA MACHINE COMPANY
(Division of Builders Iron Foundry)
61 CODDING ST., PROVIDENCE 1, R. I.

(*Continued from page 8*)

The New York State pollution abatement program gained further impetus with the recent enactment of a bill extending state financial aid to municipalities planning new sewer systems or sewage treatment plants. Under the terms of the act (Chap. 578, Laws of 1947), the state agrees to pay half the cost of plans for such projects up to a maximum of 2 per cent of their construction cost. Provision for this assistance was made on the recommendation of the Special Committee on Pollution Abatement of the Joint Legislative Committee on Interstate Co-operation, which plans to continue its studies in the field "to the end that an equitable and effective solution of the state's stream pollution problem will be realized."

More than 100 years of A.W.W.A. membership will be represented on the new three-man Board of Engineers appointed by the Detroit, Mich., city council to prepare a report on the pollution of Lake St. Clair and the Detroit River in relation to its water supply. In chronological order of A.W.W.A. affiliation, the consulting engineers designated are Samuel Greeley, Chicago (1907), William Storrie, Toronto (1915) and Malcolm Pirnie, New York (1917).

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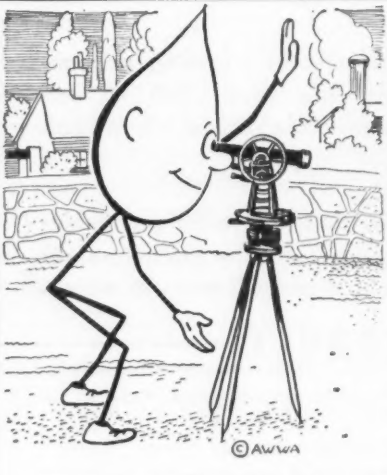


Mapping out a Public Relations Campaign?

Let Willing Water help you . . . he's the master of all he surveys. Let him clear the brush of public ignorance of water works problems. Let him erect for you an edifice of public appreciation and co-operation on a foundation of good will.

Willing Water is waiting to meet your customers and employees. Right now he has 32 different approaches to your problems in the form of low-cost blocked electrotypes or newspaper mats. And he's only beginning his career. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
500 Fifth Avenue · New York 18, New York

20" O.D. 1/2" Wall
Armco Pipe Made to
A.W.W.A. Specifications

HAS STRENGTH TO
WITHSTAND PRESSURES
OF 2500 PSI! *

Write for full information on ARMCO Spiral Welded Steel Pipe (diameters 6 to 36 inches, wall thicknesses 7/64 to ½-inch). Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 2775 Curtis Street, Middletown, Ohio.

*Ultimate strength 50,000-60,000 psi.; yield strength 30,000-40,000 psi.; elongation in 2 inches, 30%.

ARMCO

ARMCO STEEL PIPE

(*Continued from page 10*)

Research men who have had occasion to use the cumulative catalog of the Library of Congress cards recently published by the Association of Research Libraries will be glad to learn that a supplement covering the years 1942–1946 is now in production and that, beginning with January of this year, the Library of Congress itself has undertaken to continue the project by the monthly publication of a bulletin entitled *Cumulative Catalog of Library of Congress Printed Cards*. Each month's issue will include approximately 125 pages of reduced card facsimiles, approximately 35 items per page, and quarterly as well as annual cumulations of the items will be issued to all subscribers. Multi-year cumulations will be considered at a later date. It is anticipated that the new low-cost service will mark a distinct advance in making a central cataloging service of current books rapidly available to libraries—and thus to researchers.

In Havana, Cuba, last May 4, failure of another attempt to provide an adequate water system for that rapidly growing city ended in tragedy, when Mayor Manuel Fernández Supervielle, who won his election last year on that promise, admitted frustration of his purpose by suicide. In a farewell note to a friend, Dr. Supervielle indicated his despondency at public reaction to his lack of progress and announced his inability to bear any longer the anger manifested by his constituents. His death came as a shock not only to his friends and his city, which proclaimed a three-day municipal mourning period, but to his nation which he had served for ten years first as a member of the House of Representatives and then, until 1946, as Minister of the Treasury in President Grau San Martin's first cabinet.

When Dr. Supervielle left his cabinet post in 1946 to enter the Havana mayoralty campaign, he dedicated himself to the task of providing the city with a new water works, and won the election by a large majority on that pledge. In office he found it impossible to finance the $17,000,000 project proposed. The national government yielded neither funds nor support and the city council prevented his borrowing from private sources on the terms available. Faced with this deadlock and growingly conscious of public disfavor expressed in the jeers and boos that greeted his every appearance, he found his position unbearable.

Members of the A.W.W.A. Cuban and Florida Sections who attended last November's joint meeting in Havana will remember the "Alcalde" well, both for his active participation in the meetings and social functions and for his intense interest in the activities of the water works field. Perhaps his death will enable the accomplishment of his purpose in dramatizing to municipal and national authorities the necessity for accord in solving this vital problem that has faced the city for many years.

(*Continued on page 14*)

Simplicity Keynotes THIS Underdrain System

SIMPLE TO INSTALL. The ALOXITE aluminum oxide porous plate underdrain system is adaptable to large or small gravity and pressure units. It can be fitted into both new and old structures.

SIMPLE TO OPERATE. With all graded gravel eliminated, there is no displacement of filter bed. Filtration is more efficient. Backwashing is always complete and uniform. This operation usually requires less water and is accomplished in shorter time. Filtering and backwash operating heads, too, are reduced.

SIMPLE TO MAINTAIN. There is only one material to handle. The costly and tedious job of regrading sand and gravel is avoided. If required, bottom inspection is made quickly and easily. Repairs and replacements of spray nozzles, laterals, etc., are unnecessary as such metal parts are not required.

Our engineers will gladly explain, in more detail, how you might profit by utilizing the ALOXITE underdrain system. Immediate attention will be given your inquiries directed to Dept. P-67, The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

Underdrain Plates

BY CARBORUNDUM

TRADE MARK

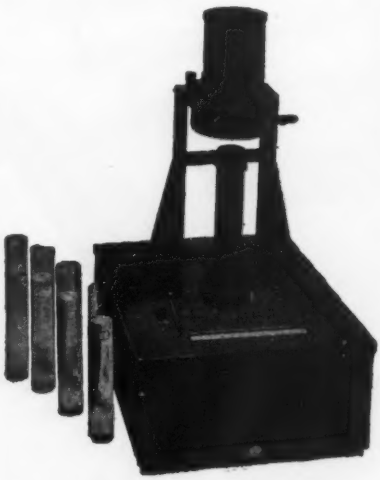
"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company

(*Continued from page 12*)

The 1946 Book of A.S.T.M. Standards, containing more than 1,400 specifications and tests in its 7,000 pages, is now ready for distribution. Having almost doubled in size since its 1939 edition, the book is now issued for the first time in five separate volumes: Part IA, Ferrous Metals; Part IB, Non-ferrous Metals; Part II, Nonmetallic Materials—Constructional; Part IIIA, Nonmetallic Materials—Coal and Coke, Petroleum Products, Aromatic Hydrocarbons, Soaps, Water, Textiles, Gaseous Fuels; and Part IIIB, Nonmetallic Materials—Electrical Insulating Materials, Plastics, Rubber, Paper, Shipping Containers, Adhesives. In addition to two extensive tables of contents—one by general materials headings, the other by serial designations—each part has a complete subject index. Later in the year a 240-page "Index to Standards" will be furnished free to purchasers.

Sales prices for the cloth-bound edition are $8 per part for Parts IA, IB, IIIA and IIIB, and $12 per copy of Part II. No discount is given for purchase of the complete set. Half-leather bindings are available at an additional cost of $2 per part. Copies are obtainable from the A.S.T.M. office at 1916 Race St., Philadelphia 3, Pa.

(*Continued on page 16*)



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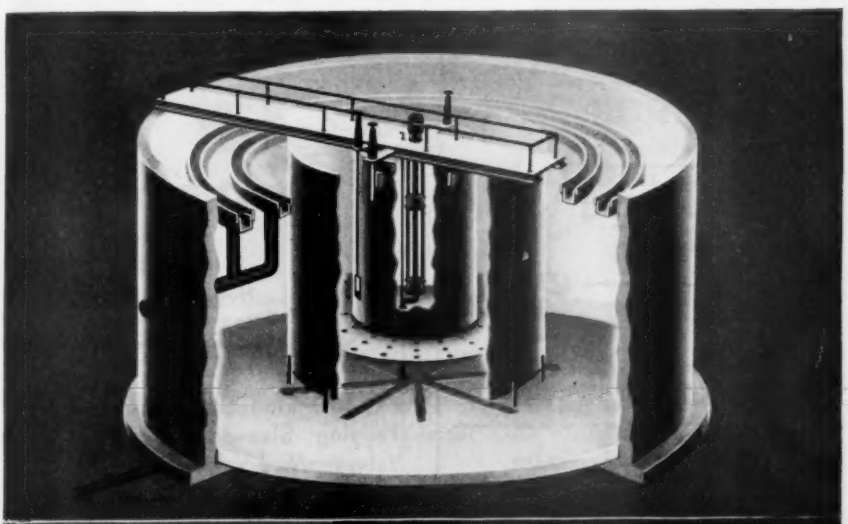

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(*Continued from page 14*)

Stephen R. Kin, formerly San. Engr. at Camp Butner, N.C., is now with the Div. of Industrial Waste, Indiana Board of Health.

A three-generation club seems to be in the offing. Following last month's report on the three Hopkins of Utica's water system, we have discovered another family parlay in the profession. "Grandfather" W. F. Cramer, engineer for the Holly-Gaskil Mfg. Co., built a number of water plants in various parts of the country, including, in 1884, the Lexington, Ky., water works and distribution system. "Father" W. S. Cramer then spent more than fifty years with the Lexington Water Co., helped organize the A.W.W.A. Kentucky-Tennessee Section, and became A.W.W.A. President in 1927. "Son" H. Cable Cramer, who is now Chairman of the A.W.W.A. West Virginia Section, has also spent his entire career in the field, beginning at the Lexington Water Co. with his father, serving as consulting engineer for several years, and now is Manager of the Catletts-burg, Kenova & Ceredo Water Co., Kenova, W.Va. "Other Son" Clark J. Cramer, who also has water in his veins, is now Chief Engineer of the Lex-ington Water Co. and Kentucky-Tennessee Section representative on the A.W.W.A. Board of Directors.

(*Continued on page 18*)

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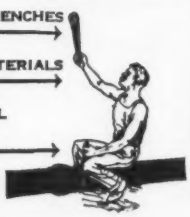

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(*Continued from page 16*)

Malcolm Pirnie was one of six engineers awarded President Truman's Certificate of Merit for "outstanding fidelity and meritorious conduct in aid of the war effort" at ceremonies held on April 14 at Governors Island, N.Y. Gen. Courtney H. Hodges, First Army Commander, presented the certificate to Pirnie for his outstanding services as Chairman of the Executive Committee of the Engineers Joint Council, which, through the National Engineers Com., studied and formulated proposals on postwar industrial control measures in Germany and Japan.

In 1913, long before the packagers of breakfast cereal had discovered the refinements of psychology which led them to distribute cereal bowls with pictures at the bottom, the contractors who erected the Halifax, N.S., Water Dept. reservoir were acute enough to provide incentives which made the recent rehabilitation of that structure a continuing treasure hunt. Workmen who were assigned to the task of chipping away eroded concrete preparatory to repairing the walls made quite a haul, excavating two dozen horseshoes, six dozen pick heads and several pre-World War I rubber boots. In reporting the incident in their article on page 503 of this JOURNAL, Messrs. Doull and Kline do not confess to any difficulties in limiting the chipping to the eroded areas, but, human nature being what it is, we surmise that constant supervision was required to keep the structure intact.

And speaking of treasure hunts, John Longmaid, a resident of Helena, Mont., had to look no farther than the filter screen of his kitchen spigot to strike it rich. Resting on the screen when he cleaned it recently were three small gold nuggets delivered with the city water supply, which comes from the head of Last Chance Gulch, one of the world's richest placer deposits. We wonder if the water department officials have considered the profitable possibility of having the supply filtered on a concession basis in the future.

(*Continued on page 22*)

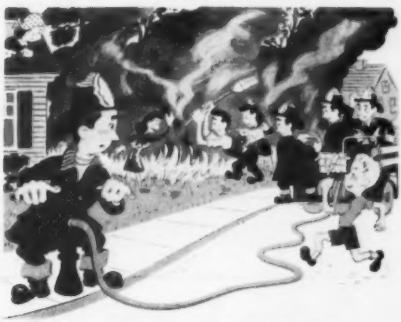
MEANS STILL BETTER PIPE

the iron before it is poured into the mold of a centrifugal casting machine. It must be obvious that this is vastly better pipe than cast iron pipe made by the rule-of-thumb methods of a century ago, even though most of that pipe is still in service.

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

PUBLIC WATER SUPPLY —The Forgotten Industry

The public takes piped running water for granted—until it's turned off. A good public water supply is never news—except on the rare occasion when something goes wrong. To help create public awareness of the service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* influential readers of "Time" and "Nation's Business." For example, the following illustration and excerpts from a current advertisement:



take no chances with fire

When even a brush-fire seems likely to get out of control, run (don't walk) to the nearest telephone or alarm box! Millions in fire losses, and thousands of lives, might have been saved by reporting small fires promptly. Your public water supply system provides, in addition to home and industrial needs, sufficient water to control fires. Over half of the cost of the average water supply system results from the necessity of providing fire protection.

By farsighted planning and efficient round-the-clock service, your public water supply system guards your health, life and property. Give it an occasional appreciative thought.

● ● ●

Because of its reliable, long-lived service, cast iron pipe is used for water mains in the fire-fighting systems of America's large cities.

Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 S. Michigan Avenue, Chicago 3, Ill.

SERVES FOR CENTURIES

(*Continued from page 18*)

Louis A. Geupel, Utility Engr., Office of Materials Supply, National Housing Agency, was recently assigned to the Cleveland regional office of the Office of the Housing Expediter as Land and Public Services Specialist for utility problems. Thus he continues the varied government service whch he started in 1943 with the acceptance of a position as Unit Chief of the Water Branch, WPB Utilities Div. In the interim, he also served as a UNRRA Industrial Engr. on special water supply projects in Greece, Yugoslavia, Russia, Poland, Albania and China and later as Unit Chief of the Office of Surplus Property Utilization.

Prior to his government service, Geupel spent seven years as Chief Engr. of the Indiana State Board of Health, eight years as Chief Engr. & San. Engr. with Ulen & Co. on water supply projects in Poland, Persia, Cuba and Greece, and eight years as City Civ. Engr., Director of Public Works and finally Supt. of Water Works at Evansville, Ind.

Simplex Valve & Meter Co., Philadelphia, has announced the appointment of Frank E. Gerlitz, Jr. as Sales Manager. Gerlitz, who started work with the company in 1941 as sales consulting engineer, had been promoted to Asst. Sales Manager in 1946. Previous to 1941 he was a designing engineer in the water and sewage treatment field and for several years had been associated with the Pennsylvania Health Dept.

James L. Tighe, head of the consulting engineer firm of Tighe & Bond, Holyoke, Mass., died April 6 after an illness of several weeks. At 83, he was one of the oldest engineers in the country actively engaged in practice. Having joined the Association in 1889, he was one of its oldest members. Only Daniel W. Mead of Madison, Wis., and Emiel A. Croll of Orlando, Fla., now survive him among those who joined the A.W.W.A. before the turn of the century.

Born in Ireland, Tighe came to Massachusetts in 1887, where, following his graduation from McGill University in 1892, he spent the early days of his career under the late Clemens Herschel, serving as engineer of the Holyoke Water Dept. from 1892 to 1911. Since that time, he had been active in a consulting capacity, doing work on the design and construction of many dams, hydraulic plants and water and sewerage systems in New England. A member of the Massachusetts Public Health Council since 1923, Tighe also acted as an expert witness for the state in damage cases arising from construction of the Quabbin Reservoir.

Tighe was elected to Honorary Membership in the Association at the 1926 Convention.

(*Continued on page 50*)

Getting at the source to control insect pests is a wise preventive measure. So is the installation of Safetop Hydrants.

A Kennedy Safetop Hydrant has a built-in Safety Breakable Section. If this hydrant is struck a smashing blow which no hydrant could withstand, the section gives 'way. The essential parts of the hydrant remain intact . . . there is no flood or geyser . . . less injury to persons or property. The hydrant can be repaired by one man in half an hour, with only $10 worth of parts.

Standardizing on Safetops is a sound preventive measure which contributes both to safety and to lower maintenance and repair costs.

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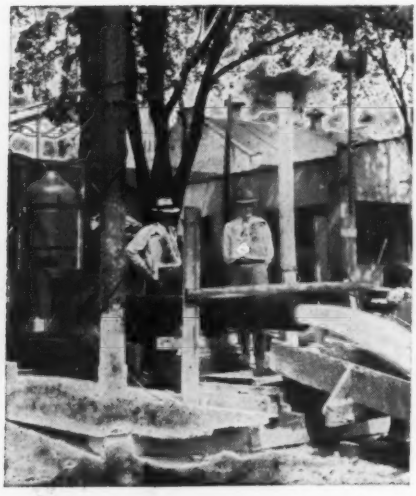

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Most of Layne's war work has been completed and more and more time is now being given to Well and Pump installations for cities and towns. Water expansion plans can now be pushed to completion.

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WELLS & PUMPS

(*Continued from page 32*)

Gannon, Edward C., Culligan Zeolite Co., San Bernardino, Calif. (Apr. '47)

Gearhart, Ralph W., Cons. Engr., 349—21st St., S.E., Cedar Rapids, Iowa (Apr. '47)

George, J. E., *see* Siloam Springs, City of

Goldberg, S. Dan, Irrigation Inspector of Southern Palestine, Jewish Agency for Palestine, 34 Yavneh St., Tel Aviv, Palestine (Apr. '47)

Golden, Frank, Dist. Mgr., Culligan Zeolite Co., 2017 Cedar Springs Ave., Dallas, Tex. (Apr. '47)

Grant, Fred, Plant Supt., Filtration Plant, North Tonawanda, N.Y. (Apr. '47)

Gray, Arthur E., Dist. Supervisor, Barrett Div., Allied Chemical Corp., Mallery Lane, West Nyack, N.Y. (Apr. '47)

Green, Stewart G., San. Engr., 4051 N.E. 23rd Ave., Portland 12, Ore. (Apr. '47)

Gregory, Robert H., Jr., Asst. Engr., Bureau of San. Eng., State Office Bldg., Richmond 19, Va. (Apr. '47)

Grieve, Robert M., Service Engr., R. W. Sparling, Box 258, Great Neck, N.Y. (Apr. '47)

Herndon, Lee R., *see* North American Rayon Corp.

Hess, Miles E., *see* National Nu Grape Co.

Holdren, Donald D., Civ. Engr., Clyde E. Williams & Assoc., 312 W. Colfax Ave., South Bend, Ind. (Apr. '47)

Holsworth, A. W., Supt., Water Dept., 314 W., Box 294, Hollister, Calif. (Apr. '47)

Huffstetler, Leonard G., Jr., Chief Operator, Filtration Plant, Water Dept., Lenoir, N.C. (Apr. '47)

(*Continued on page 36*)

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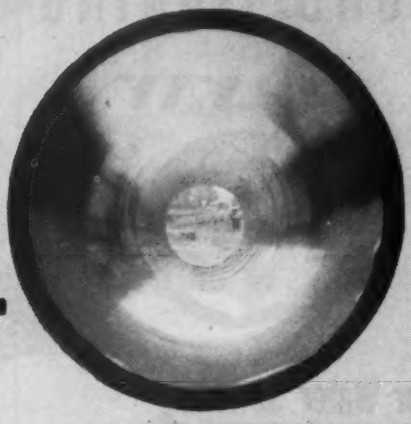

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(*Continued from page 34*)

Humber, J. B., Pres., H & H Eng. Co., Inc., Box 429, Beeville, Tex. (Apr. '47)

Kaplan, Morris, Chem. Control Engr., South Dist. Filtration Plant, 3300 E. Cheltenham Pl., Chicago 49, Ill. (Apr. '47)

Kelly, John R., Plant Supt., Gainesville, Fla. (Apr. '47)

Keuka College, Earl Darmstadt, Supt. of Bldgs. & Grounds, Keuka Park, N.Y. (Corp. M. Apr. '47)

Lalonde, J. A., Cons. Engr., J. A. Lalonde & Co., Ltd., 958 Dunlop Ave., Montreal 8, Que., Can. (Apr. '47)

Lambert, Georges, San. Inspector, Prescott & Russell Health Unit, 33 Main St., W., Hawkesbury, Ont., Can. (Apr. '47)

Lane, Lafayette Emmett, Cons. Engr., Masonic Temple Bldg., Willmar, Minn. (Apr. '47)

Langlois, Charles, City Engr., 1445 Maguire Ave., Sillery, Que., Can. (Apr. '47)

Lavigne, Wilfrid, Supt., Sainte-Anne-de-Bellevue, Que., Can. (Apr. '47)

Lefever, Kenneth W., Civ. Engr., 303 Gazette Bldg., Little Rock, Ark. (Apr. '47)

Leonard, Arthur S., Culligan Zeolite Co., Northbrook, Ill. (Apr. '47)

LeRoyer, Albert, Water Works Supt., City Hall, St. Lambert, Que., Can. (Apr. '47)

Macedonia, John A., Pres.-Mgr., Culligan Soft Water Service Co., Jefferson & Elk Sts., Steubenville, Ohio (Apr. '47)

Maclean, William D., Chem. Engr., Associated Chemical Co. of Canada, 14 Darrell Ave., Toronto 13, Ont., Can. (Apr. '47)

Marshall, Lester R., Supt. of Water, Waverly, N.Y. (Apr. '47)

Mascia, Vincent, Asst. Supt., Westchester Joint Water Works No. 1, 126 Halstead Ave., Mamaroneck, N.Y. (Apr. '47)

Micucci, Joseph N., Eastern Dist. Mgr., Culligan Zeolite Co., 136 Liberty St., New York 6, N.Y. (Apr. '47)

Milaeger, Ralph E., Dist. Engr., Layne-Pacific, Inc., 601 Dexter-Horton Bldg., Seattle, Wash. (Apr. '47)

Moon, Levell, Comr. of Public Works, City Bldg., Lockport, N.Y. (Apr. '47)

(*Continued on page 38*)

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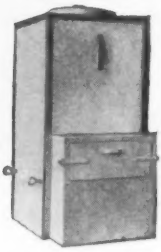

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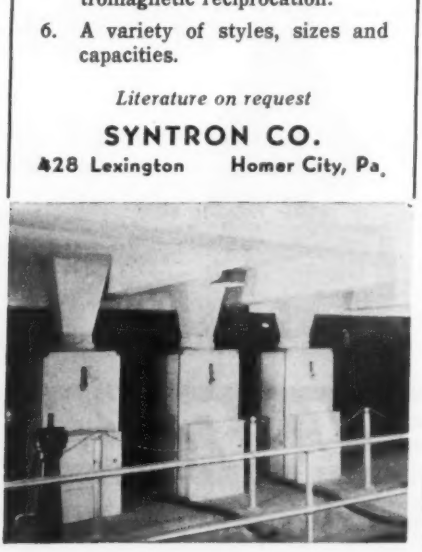

(*Continued from page 36*)

Moore, Theodore L., Civ. Engr., U.S. Bureau of Mines, Anvil Points No. 1, Rifle, Colo. (Apr. '47)

Murphy, T. L., Chemist, Water Works, Fargo, N.D. (Apr. '47)

National Lead Co., Titanium Div., H. S. Bird, MacIntyre Development, Tahawus, N.Y. (Corp. M. Apr. '47)

National Nu Grape Co., Miles E. Hess, Asst. Chemist, Box 1477, Atlanta 1, Ga. (Corp. M. Apr. '47)

Nicholson, Gordon A., Town Engr. & Water Works Supt., 35 Church St., Pictou, N.S., Can. (Apr. '47)

North American Rayon Corp., Lee R. Herndon, Head of Chem. Lab., Elizabethton, Tenn. (Corp. M. Apr. '47)

Northport Water Works Co., The, Hugh M. Pierce, Pres., 50 Church St., New York 7, N.Y. (Corp. M. Apr. '47)

O'Donnell, Charles F., Engr., Nussbaumer & Clark, 327 Franklin St., Buffalo 2, N.Y. (Apr. '47)

Payette, Sedric A., Mgr., Clallam County Public Utility Dist., Box 951, Port Angeles, Wash. (Apr. '47)

Pequegnat, R. K., Sr. San. Engr., Dept. of National Health & Welfare, 615 Jackson Bldg., Ottawa, Ont., Can. (Jan. '47)

Philips, Everett A., Asst. Engr., Water Dept., 10 City Hall, Alhambra, Calif. (Apr. '47)

Pierce, Hugh M., *see* Northport Water Works Co., The

Pierson, James R., Pres., Pothat Water Co., 9 Park Pl., New York, 7, N.Y. (Apr. '47)

Probst, Harold A., Repr., Mueller Co., 815 Ballantyne Rd., Syracuse, N.Y. (Apr. '47)

Pung, Donald W., *see* Bettenburg, P. C.

Queneau, Roland B., Dist. Mgr., The Pitometer Co., 50 Church St., New York 7, N.Y. (Apr. '47)

Radelat, Luis, Engr. in Charge, Sanitation Works, Public Health Dept., Calle 30 No. 293 (Altos) Entre 23 y 25, Vedado, Havana, Cuba (Apr. '47)

Rasmusson, Marvin H., *see* Standard Brands, Inc.

Robeck, Charles, Contractor-Sales Mgr., Robeck Construction Co., Sunderland Bldg., Omaha, Neb. (Apr. '47)

(*Continued on page 40*)

Fabricating reinforcement cages—joint rings in left foreground.

ANOTHER MILESTONE IN WATER SUPPLY LINE CONSTRUCTION

Lock Joint Concrete Pressure Pipe will be used in over 90% of San Diego's great new 71.3 mile Aqueduct. It will combine high initial and sustained carrying capacity with long life, at low cost.

The last miles of pipe are now being poured for this vital supply line that will connect San Diego with the Colorado River Aqueduct. With diameters ranging from 48″ to 96″, this line provides another demonstration of advantages obtained by using Lock Joint Concrete Pressure Pipe for main water supply lines. Ample strength for higher operating heads (up to 550 feet in this aqueduct), water-tightness, permanence and low maintenance costs are proven by performance here and throughout the country. Economies in first cost, installation and operation have been shown under the full range of operating conditions.

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(*Continued from page 38*)

Roberts, L. J., Gas & Water Supervisor, Southwestern Public Service Co., Box 1261, Amarillo, Tex. (Apr. '47)

Roche, Jack B., Dist. Mgr., Culligan Zeolite Co., 3229 Easton Blvd., Des Moines, Iowa (Apr. '47)

Ruhl, J. Luther, Supervisor of Water Dept., War Dept., Carlisle Barracks, Boiling Springs, Pa. (Apr. '47)

Ryan, Beverly E., Asst. Engr., Municipal Water Works, Robinson Memorial Auditorium, Little Rock, Ark. (Apr. '47)

St. James Water Dist., Frank Frederick Sr., Supt., Water Plant, St. James, N.Y. (Corp. M. Apr. '47)

Sanchez, J. H., Civ. Engr., Dept. Estudios y Proyectos, Inst. Nacional de Obras Sanitarias, Caracas, Venz. (Apr. '47)

Schanafelt, W. E., Water Comr., Water Dept., Chadron, Neb. (Apr. '47)

Schiller, Bernard, San. Engr., Southern California Water Co., 1206 S. Maple Ave., Los Angeles 15, Calif. (Apr. '47)

Schulte, Oscar, Supt. of Water, Pumping Station, Tonawanda, N.Y. (Apr. '47)

Shultz, Clifton S., Supt., Water Dept., 415 Neva St., Sebastopol, Calif. (Apr. '47)

Sillence, Henry W., Supt., Owasco Water Works, R.D. No. 2, Auburn, N.Y. (Apr. '47)

Siloam Springs, City of, J. E. George, City Engr., Siloam Springs, Ark. (Corp. M. Apr. '47)

Standard Brands, Inc., Marvin H. Rasmusson, Asst. Gen. Plant Supt., Peekskill, N.Y. (Corp. M. Apr. '47)

Streit, William H., Mgr., Terre Haute Water Works Corp., Terre Haute, Ind. (Jan. '47)

Tanghe, Edward F., Asst. Supt., Water Works, City Hall, Milwaukee, Wis. (Apr. '47)

Van Trump, Roderick, Asst. Director-Mgr., Southern Div., Van Trump Testing Lab., 219 Terminal Warehouse Bldg., Little Rock, Ark. (Apr. '47)

Varner, C. W., Pres., Varner Well Co., Box 237, Dubuque, Iowa (Jan. '47)

Walker, Harold, Chief Operator, Filtration Plant, Water Works Com., St. Catherines, Ont., Can. (Apr. '47)

Walker, Rupert G., Supt. of Water Works, 14 Buck St., Canton, N.Y. (Apr. '47)

(*Continued on page 42*)

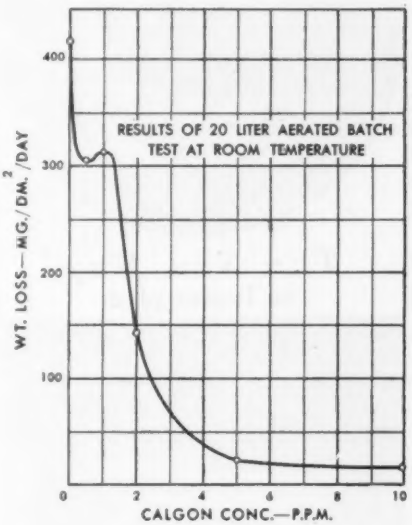
Calgon* Controls Corrosion

This graph illustrates the effect of various concentrations of Calgon in inhibiting steel corrosion.

The peculiar hump in the curve was confirmed by several duplicate tests. It may be due to the coagulating effect of a very low concentration of Calgon, which might produce a slight increase in the protective action of the rust film. At higher concentrations a peptizing action is obtained.

This curve was obtained from 20-liter aerated batch tests at room temperature. In continuous or intermittent flow systems, comparable results are obtained with lower concentrations of Calgon. In actual service, optimum concentration may be higher or lower than the curve indicates, depending on a variety of conditions.

Calgon is now used by hundreds of municipal water systems in the United States, Canada and European countries, not only for its corrosion-inhibiting property, but because it also prevents scale and eliminates



"red water." Mains, distributing lines and meters are kept in better condition; consumer complaints are reduced.

The corrosion-inhibiting property of Calgon is discussed in detail in an article "Corrosion Control with Threshold Treatment" which appeared in *Industrial and Engineering Chemistry*. We will be glad to send you a reprint of this article.

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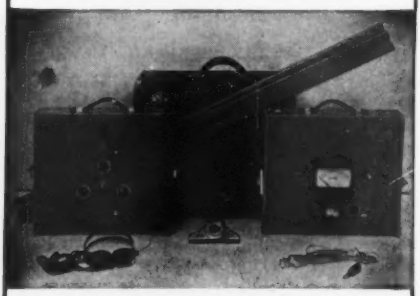

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(*Continued from page 40*)

Wardle, J. McClure, Supt. of Public Works, Dept. of Public Works, City Hall, Hudson, N.Y. (Jan. '47)

Warren, M. A., Engr., U.S. Geological Survey, Water Resources Board, Washington 25, D.C. (Apr. '47)

Watson, James D., Partner, Watson & Hart, Engrs., 216 W. Market St., Greensboro, N.C. (Apr. '47)

Weisbeck, R. J., Comr. of Water, Alden, N.Y. (Apr. '47)

Willey, Kenneth L., Water Supt., City Water Dept., Blaine, Wash. (Apr. '47)

Zinsmeister, Herbert F., Engr., Wallace & Tiernan Co., Inc., 320 W. Main St., Carmel, Ind. (Apr. '47)

REINSTATEMENTS

Ables, Abbott J., Supt., Water Works, Hampton, Ark. (Oct. '43) *M*

Merrill, Neal P., Mio, Mich. (Apr. '43) *P*

Prehn, Louis E., Supt., Water Works, 7644 Jackson Blvd., Forest Park, Ill. (July '44)

LOSSES

Deaths

Britton, J. C., Supt., Water Dept., Avon Lake, Ohio (Affil. Jan. '40) *P*

Haas, Frank S., Secy., Board of Trustees, City Water Works, 35 N. Main St., Council Bluffs, Iowa (July '35) *A*

Langston, J. H., Mfrs. Agent, 311½ Zack St., Tampa 2, Fla. (July '38)

Morrison, Thomas J., Cons. Engr., Rochester 9, N.Y. (Mar. '34) *P*

Rainey, Clarence M., Water Supt., 735 W. Bonneville St., Pocatello, Idaho (Nov. '27)

Tighe, James L., Tighe & Bond, Cons. Civ. & Hydr. Engrs., 189 High St., Holyoke, Mass. (Apr. '89) *Honorary M. '26. M P*

Resignations

Ashford, F. J., City Clerk, Box 1040, Swift Current, Sask., Can. (Jan. '37)

Durbin, W. H., Mgr., Terre Haute Water Works Corp., 119 S. 7th St., Terre Haute, Ind. (May '23) *A M P*

Flannery, Charles A., 770 Garland Drive, Palo Alto, Calif. (Oct. '38)

Forsberg, Helge, Supt., Works Dept., Township of Whitney, Porcupine, Ont., Can. (July '46)

(*Continued on page 44*)

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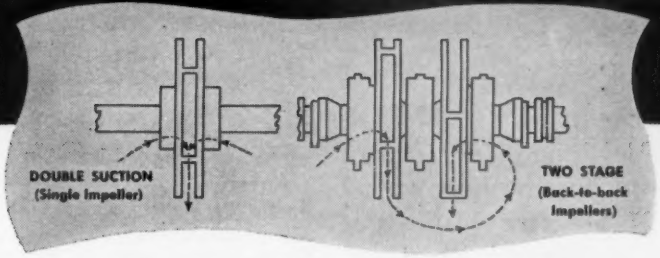
AMERICAN *Double Suction and Two-Stage Centrifugal Pumps Minimize End-Thrust Wear... Give Longer Trouble-Free Service*



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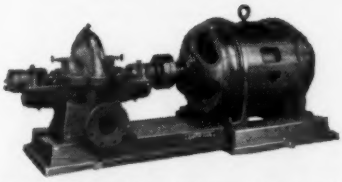

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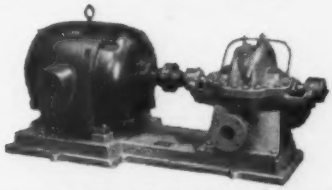

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(*Continued from page 42*)

Hollister Water Dept., A. W. Holsworth, Mgr., 342—5th St., Hollister, Calif. (Corp. M. Jan. '46)

Hudson Dept. of Public Works, J. McClure Wardle, Supt. of Public Works, Hudson, N.Y. (Corp. M. Oct. '38)

McCarroll, W. J., Supt., Munic. Water Plant, Fulton, Mo. (Apr. '46) *M*

McDivitt, William A., 331—4th St., Freeport, Pa. (July '39)

Schuck, H. W., Supt. of Water Dept., 804 Bayswater Ave., Burlingame, Calif. (June '27)

Thompson, N. J., Sales Mgr., Thompson Pipe & Steel Co., 3001 Larimer St., Denver 11, Colo. (Oct. '39) *P*

Thomson, J. A., Apdo. 1715, Havana, Cuba (Jan. '41)

Whitney, Township of, W. F. Strutt, Clerk, Porcupine, Ont., Can. (Corp. M. Apr. '44)

Wilson, Guy L., Local Supt., Washington Water Power Co., Lewiston, Idaho (July '34) *P*

(*Continued on page 46*)

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Mathieson
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(*Continued from page 44*)

Changes in Address

Changes received between April 5 and May 5, 1947

Arbuthnot, James B., c/o State Board of Health, Univ. of Kansas, Lawrence, Kan. (Oct. '46)

Atwell, Daniel J., Dresser Mfg. Div., 27 S. Van Dien Ave., Ridgewood, N.J. (Oct. '46)

Bass, J. H., Infilco, Inc., 2735 Kent Rd., Columbus 8, Ohio (Oct. '46)

Beall, R. R., 310 Main St., Oneida, Tenn. (Affil. Oct. '42)

Bonham, H. E., Assoc., Paul A. Uhlmann & Assoc., 1441 N. High St., Columbus 2, Ohio (Jan. '44) *P*

Clayton Mfg. Co., Box 550, El Monte, Calif. (Assoc. M. Oct. '39)

Consoer, Arthur Wardell, Chief Exec. Partner, Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago 11, Ill. (July '39) *AP*

Cranch, Eugene T., 208 Centre Ave., New Rochelle, N.Y. (Mar. '22) *M*

Fairview Farms Water Co., Box 186, Costa Mesa, Calif. (Corp. M. Jan. '47)

Forbes, H. de B., Jr., Lt.Col., CE, USA, Headquarters, 20th Air Force, APO 234, c/o Postmaster, San Francisco, Calif. (Jan. '46)

Geupel, Louis A., c/o OHE Regional Expediter, 717 E. Superior Ave., Cleveland 14, Ohio (Nov. '22) *MP*

Gray, Marvin A., Box 14, San Clemente, Calif. (Jan. '46)

Hardin, Eugene A., 3113 W. Queen Lane, Philadelphia 29, Pa. (Nov. '25) *P*

Harris, H. H., Engr. & Water Supt., Palisades Del Rey Water Co., 327 Napoleon St., Venice, Calif. (Oct. '38) *M*

Horlacher, George A., H. R. Bowers Co., 1060 Leader Bldg., Cleveland 14, Ohio (Jan. '43)

Jordan, D. E., Apdo. 1715, Havana, Cuba (Jan. '41)

Kin, Stephen R., Bureau of San. Eng., 1098 W. Michigan St., Indianapolis, Ind. (Oct. '42) *M*

Kleiser, Paul J., T. T. Hardman Assoc., Cons. Engrs., Hippodrome Bldg., Terre Haute, Ind. (Jan. '37) *M*

Krell, A. J., 11271 Sardis Ave., Los Angeles 34, Calif. (Apr. '39)

Lang, William H., San. Engr., Esso Eng. Dept., Standard Oil Development Co., Box 37, Elizabeth B, N.J. (Oct. '42) *MP*

Larson, Harry, Lt.Col., Hotel Eilers, Fort Dodge, Iowa (Oct. '41) *P*

Lasley, James B., Eng. Dept., Springs Mills, Inc., Lancaster, S.C. (July '45) *MP*

Lauter, Carl J., The Dist. Engr., U.S. Engr. Office, 1st & Douglas Sts., N.W., Washington 25, D.C. (Apr. '22) *Fuller Award '42. Director '45–'48. MP*

Leopold, F. O., F. B. Leopold Co., Inc., 2413 W. Carson St., Pittsburgh 4, Pa. (Jan. '44) *P*

Lewis, Harry, Peerless Service Co., Orion, Ill. (Jan. '45)

Lowe, James C., Sales Engr., Oliver United Filters, Inc., 221 N. La Salle St., Chicago 1, Ill. (Oct. '43) *MP*

Lurie, David, American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y. (Jan. '45) *MP*

Main, T. C., Cons. Engr., 253 Niagara St., Winnipeg, Man., Can. (Jan. '37)

Martin, H. Fred, c/o Garrett Eng. Co., 1806 Milam St., Houston, Tex. (Jan. '46) *MP*

McGarth, R. L., 2714—60th St., Sacramento, Calif. (Apr. '43) *P*

Middleton, Francis M., U.S. Public Health Service, E. 3rd & Kilgour Sts., Cincinnati 2, Ohio (Jan. '43) *P*

Miller, Arthur P., U.S. Public Health Service, 2723 Social Security Bldg., 4th & Independence, S.W., Washington 25, D.C. (Sept. '20) *P*

Montgomery, James M., Cons. Engr., 117 E. Colorado Ave., Pasadena 1, Calif. (June '27) *P*

Morrill, Arthur B., 13563 Birwood Ave., Detroit 4, Mich. (Oct. '25) *P*

Norgaard, John T., 17045 Broadway Terrace, Oakland 11, Calif. (Jan. '45) *AMP*

Phillips, Robert S., 2138 Kirkwood Ave., Charlotte, N.C. (Oct. '35) *MP*

Ramirez, Conrado S., c/o Eng. Div., Manila Engr. Dist., Harrison & Ortigas Sts., Pasay, Rizal, P.I. (Jan. '47)

Rice, Archie H., 1154 Polk St., Corvallis, Ore. (Jan. '42) *M*

(*Continued on page 48*)

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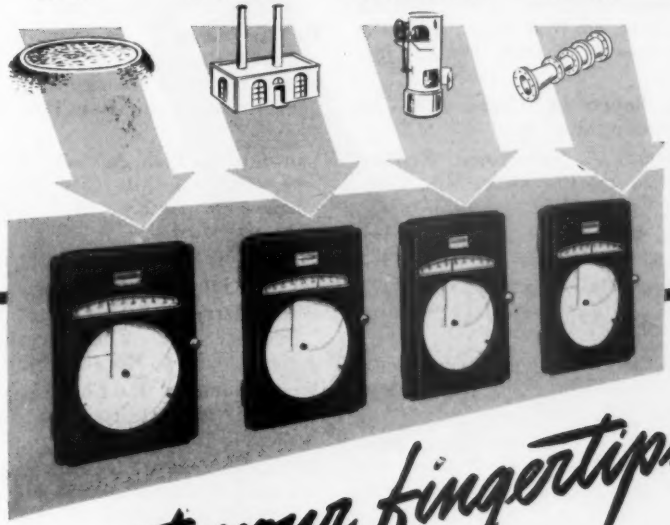

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(*Continued from page 46*)

Richardson, Andrew K., Sales Repr., Worthington-Gamon Meter Co., 814 Kingston Ave., Racine, Wis. (Oct. '46)

Ryan, Edmund J., Headquarters, Alaskan Service Base, c/o Base Engr., APO 942, c/o Postmaster, Seattle, Wash. (Jan. '43) *P*

Shephard, Robert O., Capt., 2716—7th St., Meridian, Miss. (Jan. '43) *MP*

Siebert, Harry J., Sales Engr., Neptune Meter Co., 753 Providence Rd., Charlotte, N.C. (July '45)

Smedberg, C. W., Box 1382, Atlanta 1, Ga. (Dec. '22) *Director '31–'34. AMP*

Sparks, Harry H., c/o E. L. Baumgardner, Route No. 1, Box 309 R.F.D., Encinitas, Calif. (Sept. '31) *MP*

Starling, Charles H., Field Engr., Infilco, Inc., 511 Sunset Blvd., Baton Rouge 14, La. (July '38) *P*

Stephenson, R. J., Asst. San. Engr., Dept. of National Health & Welfare, 321 Federal Bldg., Vancouver, B.C., Can. (Jan. '45) *MP*

Tanner, William S., Dept. of Public Works, 616—10th St., Modesto, Calif. (Jan. '45)

Taylor, Joseph S., 97 Kingsman Rd., Boothwyn, Pa. (Jan. '46) *P*

Terrill, James G., Jr., San. Engr., U.S. Public Health Service, Div. of Com. Officers, Social Security Bldg., 4th & D Sts., S.W., Washington, D.C. (Apr. '44) *P*

Vance, L. S., Tech. Adviser, Metropolitan Sewer Dist., 310 City Hall Annex, Louisville 2, Ky. (Apr. '38) *Fuller Award '38. AM*

Victory, T. M., Apdo. 1715, Havana, Cuba (Jan. '41) *MP*

Wade, Harry D., Sales Agent, U.S. Pipe & Foundry Co., 2105 Bryant Bldg., Kansas City 6, Mo. (Oct. '45)

Weir, Kenneth J., Chief Engr., W-M Corp., 608 S. Dearborn St., Chicago 5, Ill. (Jan. '44)

Yates, Herman A., Jr., San. Engr., South Dist. Filtration Plant, 3300 E. Cheltenham Pl., Chicago 49, Ill. (July '41) *P*

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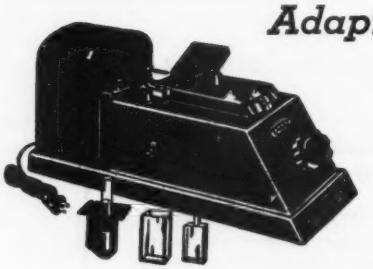

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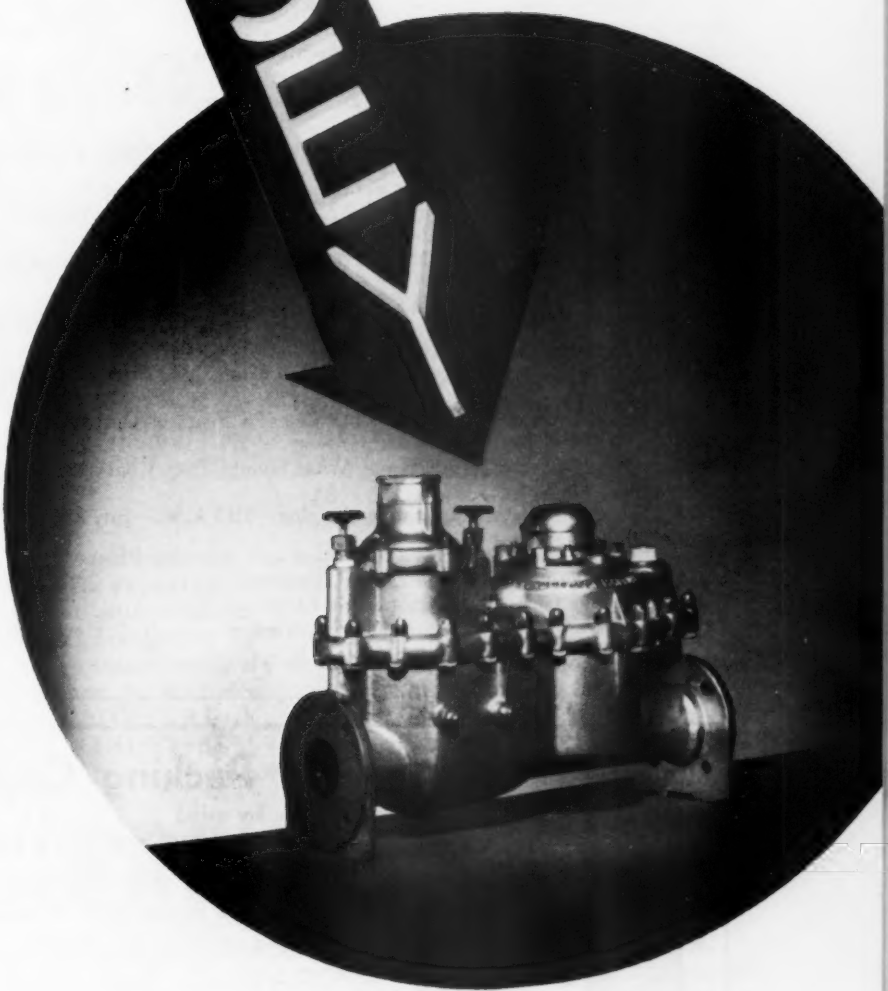

(*Continued from page 22*)

A.W.W.A. 67th ANNUAL CONFERENCE

PRELIMINARY PROGRAM

General Session—10:00 A.M.—July 21

The Colorado River, the Southwest's Greatest Water and Power Resource . . S. B. Morris
The Problem of Water Development on Pacific Islands With Special Reference to Salt Water Intrusion . . . . . Frederick Ohrt
Hydro-pneumatic Pumping Stations . . . . . O. G. Goldman

Joint Session—Plant Management & Finance & Accounting Divisions—2:00 P.M.—July 21

Recent Revenue Bond Legislation . . . . . L. N. Thompson
Experiences in Revenue Bond Financing . . . . . S. B. Robinson
How Shall Rate Structures Be Adjusted to Meet Rising Cost Levels? . . . . L. R. Howson
Symposium—Water Main Extension Policy . . . . . W. V. Weir, M. P. Hatcher, F. R. Berry, E. F. Dandridge, L. S. Finch & C. M. Hoskinson

Water Purification Division—2:00 P.M.—July 21

Selection and Control of Sampling Points in a Distribution System . . . . . K. W. Brown
Why (and How) Disinfect Water Mains? . . . . . C. K. Calvert
Preliminary Report of Committee on Open-Air Reservoirs . . . . . N. J. Howard
Pollution of Potable Water by Macroscopic Organisms . . . J. C. Weart & C. W. Klassen

General Session—9:30 A.M.—July 22

Applying Business Principles to Water Works Operation . . . . . G. E. Arnold
Value of Public Service Commission Control to Municipal Water Works Management . . A. P. Kuranz
The Washington Suburban Sanitary District—28 Years of Operations . . . . . H. R. Hall & H. B. Shaw
Water Works Rules and Regulations—What Should They Contain? . . . . M. P. Hatcher

Water Purification Division—9:15 A.M.—July 22

Disposal of Wastes From Water Purification and Softening Plants . . . . W. W. Aultman
Separation of Water From Solid-Liquid Mixtures . . . . . A. A. Kalinske
Control of Slime Growth in Transmission Lines . . . . . R. L. Derby
Super-chlorination and De-chlorination Experiences . . . . . N. J. Howard & C. J. Lauter

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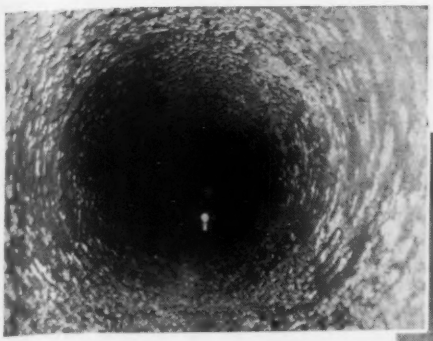
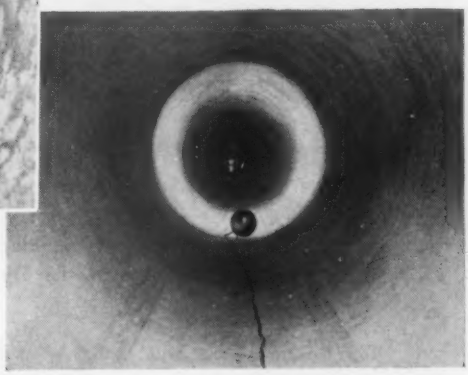


Newark, New Jersey, Pequannock Aqueduct No. 1. Left: Tuberculated Section before cleaning. Right: Section after cleaning and cement lining.



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The above 48 inch fully riveted steel water supply conduit of the City of Newark, N. J. had an average Williams & Hazen Flow Coefficient ("C" Value) of 110 when first laid and tested in 1892. Tuberculation and incrustation reduced that "C" Value to an average of 70 to 75 after 54 years of use. After cleaning and cement lining with the Preload Pipe Lining Machine the "C" Value of that important water supply line was increased to an average of 128 to 130.

That represents an average increase of 79% in flow capacity and an average of 17% greater capacity than when built 54 years ago, due to the smoothness of lining and covering of the lap joints and rivet heads.

The illustrations tell a convincing "before and after" story. The result is a "better than new" pipe line for the City of Newark which made possible the conservation of the original water main investment, and an increased and sustained maximum revenue producing flow capacity.

PRELOAD experience, equipment, and nation-wide facilities are at your service for high efficiency cement lining of mains 24 inches in diameter and larger. WRITE FOR OUR NEW PIPE LINING BULLETIN.

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PRELOAD

Designers and Builders of Prestressed Concrete Structures. Prestressed Concrete Storage Tanks and Pressure Pipe. Cement Lining 24" Pipe and larger.

(*Continued from page 50*)

Joint Session—A.W.W.A. & F.S.W.A. Ground Water Pollution Problems—2:00 P.M.—July 22

Basic Concepts in Ground Water Law.....A. P. Black
Ground Water Production Works.....Malcolm Pirnie & R. W. Sawyer
Formulating Legislation to Protect Ground Water From Pollution.....B. E. Doll
Developing Standards for Protection of Ground Water From Pollution..R. F. Goudey

General Session—9:30 A.M.—July 23

The Program of the A.P.H.A. for Engineering Personnel..W. T. Ingram & F. B. Elder
Upgrading the Water Works Industry.....J. H. Murdoch
Engineers' Organizations for Labor Bargaining Purposes.....S. S. Green
The Significance of Anti-Strike Legislation Directed Toward Public Employees.....
W. R. LaDue

Joint Session—A.W.W.A. & F.S.W.A. Reclamation of Sewage Effluents—2:00 P.M.—July 23

Industrial Uses for Reclaimed Sewage Effluents.....N. T. Veatch
Use of Reclaimed Sewage Effluents of Baltimore.....Abel Wolman
Agricultural Uses for Reclaimed Sewage Effluents.....L. V. Wilcox
Limits of Pollution of Water for Industrial Use.....S. T. Powell

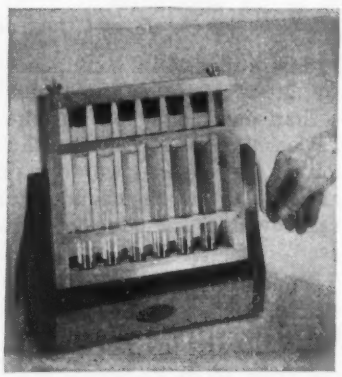
(*Continued on page 54*)

"D.M." TEST FOR ALGAE CONTROL

An accurate method for pre-determining the effective dosage of copper sulfate in algae control.

(Ref.: William D. Monie, Water and Sewage Works, **93**, 173–176, 1946)

LaMotte D.M. Tube Inversion Rack



By means of a simple procedure designated as the "D.M." Test it is possible to determine the exact amount of chemical required to destroy and inhibit algae growth. This test will eliminate the haphazard use of copper sulfate, both under- and over-dosage, thereby promoting direct cost control. In other words the "D.M." test permits the operator to quickly determine the exact amount of copper sulfate for the specific water to be treated.

The LaMotte "D.M." Tube Inversion Rack, complete with six matched graduated tubes and stoppers $15.00 f.o.b. Towson, Md.

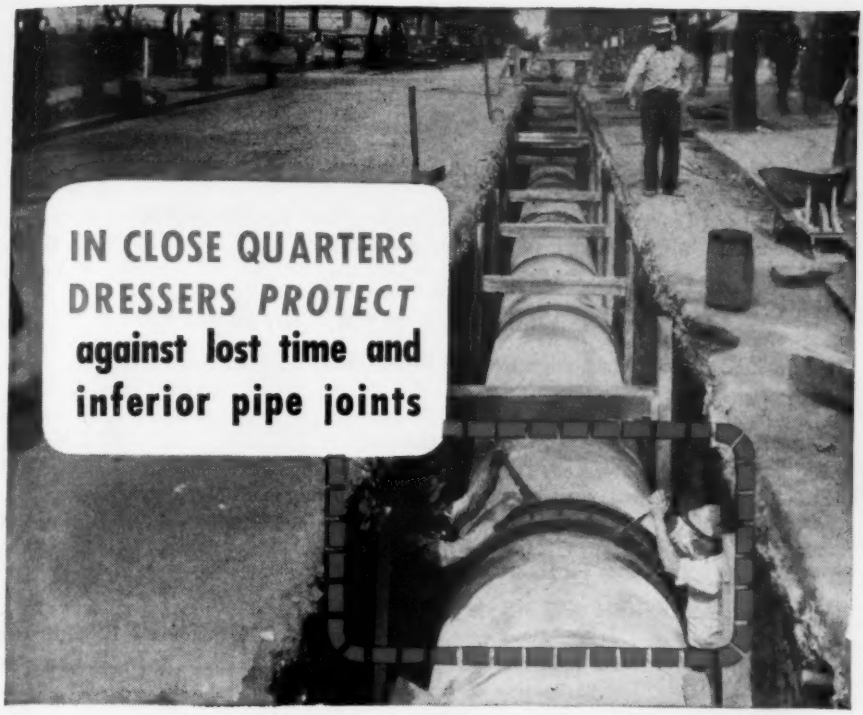
Reagents and glassware to complete the apparatus for this test can be supplied at standard prices.

Write for complete information

If you do not have the LaMotte "ABC of pH Control" a complimentary copy will be sent upon request without obligation.

LaMOTTE CHEMICAL PRODUCTS COMPANY

Dept. AWA **Towson 4, Md.**

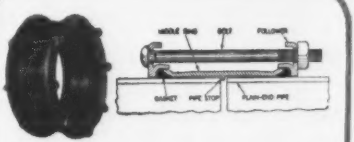


In metropolitan areas, narrow ditches and cramped working spaces, due to traffic congestion and subsurface structures, often impede the rapid installation of pipe lines. This means loss of time and money.

The use of Dresser Couplings speeds installation in city streets and, at the same time, assures a *uniform, permanently tight pipe joint.* Dressers' simplicity and ease of assembly allow any workman to join pipe quickly and efficiently under the most difficult conditions.

Avoid prolonged traffic tie-ups, expensive machinery breakdowns and delays due to inclement weather. Choose the coupling which can be assembled any time, anywhere, with uniform performance assured under all conditions.

Dresser *precision-made* couplings and repair products have long been held in the highest regard by engineers everywhere because of their permanent tightness, simplicity and over-all economy. Write today for further information.



SIMPLE—SURE—PERMANENT

Very few parts . . . all factory built . . . easy to assemble. Style 38 Couplings are made for pipe from 3/8" to 60" and larger.

DRESSER MANUFACTURING DIV., BRADFORD, PA. Houston Office and Warehouse, 1121 Rothwell St., Sec. 16, Houston, Texas. In Canada, Dresser Manufacturing Co., Ltd., 60 Front St., West, Toronto, Ontario.

DRESSER COUPLINGS

ONE OF THE DRESSER INDUSTRIES

(*Continued from page 52*)

Joint Session—Plant Management & Finance & Accounting Divisions—9:30 A.M.—July 24

Testing Materials and Equipment for Water Works Construction and Operation..... W. W. DeBerard & H. P. Hagedorn
Results of Fifteen Years of Underground Street Leakage Work in Chicago..... J. B. Eddy
Notes on Long Line Hydraulic Studies: Equipment and Procedures...Fred C. Scobey
Experience With Steel Pipelines After Lining in Place.....W. G. Banks
Discussion.....W. R. LaDue

General Session—2:00 P.M.—July 24

Lessons in Water System Design Derived From World War II..... H. S. Swanson & S. A. Evans
Discussion.....L. H. Enslow
Erosion Control in Mountain Areas of California.....C. J. Kraebel
Erosion Control in Watersheds of the East Bay Municipal Utility District..L. S. Hall
Erosion Control in Watersheds of the Los Angeles Department of Water & Power..... B. S. Grant

Water Purification Division—2:00 P.M.—July 24

Operating Characteristics of Synthetic Siliceous Zeolites..... L. Streicher, H. E. Pearson & E. A. Bowers
Use and Interpretation of Langelier Stability Diagram.....W. B. Lawrence
Calculation of the pH of Saturation of Tricalcium Phosphate..... Jerome Green & J. W. Ryznar
Chemical Fixation of Oxygen in Industrial Water Supplies.....D. J. Pye

General Session—9:30 A.M.—July 25

The Use of Radio in Water System Operation and Maintenance.....A. Damiano
Discussion.....B. A. Currie & W. C. Morse
Should Public Water Supplies Be Used as Means of Mass Medication?...Abel Wolman
Inter-industry Problems Derived From Cathodic Protection.....F. E. Dolson
Discussion.....L. J. Alexander & F. D. Pyle
Municipal vs. Residential Water Softening.....D. L. Maffitt
Discussion.....H. M. Olson

(*Continued on page 56*)

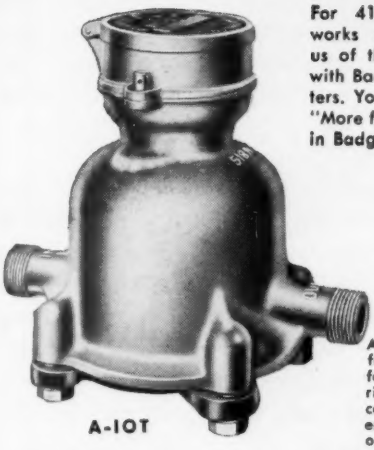
"Meet me at the Well"

In the Main Arena of the San Francisco Civic Auditorium

when A.W.W.A. and F.S.W.A. members turn out en masse to see what's new, talk shop, renew acquaintances, swap ideas at their joint annual conventions, from—

July 21 to July 25, 1947

Let Badger Meters **SAVE** *for you!*



A-IOT

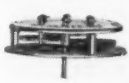
For 41 years waterworks men have told us of their satisfaction with Badger Water Meters. You, too, can get "More for your money", in Badger Meters.

SC-IOT

Above, left, Model A-IOT, frost proof meter, designed for cold climates. Above right, Model SC-IOT, (split case), designed for warmer climates. Oil enclosed or open type gear trains are optional.

Two Piece Measuring Chamber—Snap joint construction; no screws; all bronze. Smooth internal surface eliminates excessive wear and maintains accuracy. An actual comparison will convince you.

Three Piece Disc — The disc is of the flat three piece design. Component parts are made of the best grade of vulcanized rubber. Extreme care is taken to see that all parts are concentric with each other.



Circular Reading Registers—All parts of non-ferrous materials, heavily plated to guard against corrosion. All bearings are rubber bushed. Dials have heavy copper base; black letters on white porcelain for ease in reading.

Straight Reading Registers — Non-ferrous materials; heavily plated. Indestructible brass number wheels are not affected by heat. Dials are of the same high quality as used on all regular Badger circular reading registers.

Men and women of Badger Meter take personal pride in Precision Production.

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(*Continued from page 54*)

Robert S. Phillips, former Chief Chemist of the Durham, N.C., Water & Sewer Dept. and Secretary-Treasurer of the A.W.W.A. North Carolina Section from 1938 through 1943, returned from active military service early this year to take over the position of San. Engr. & Supt. of Plants for the Charlotte, N.C., Water Dept. In service since January 1944, Phillips spent his first year as medical inspector in two Florida hospitals, after which he was assigned to the position of Dept. San. Engr. for the Panama Canal Dept. and given responsibility for malaria control activities in the Canal Zone area.

William H. Lang, formerly Associate Editor of *Water Works Engineering,* is now San. Engr. for the Esso Engineering Dept., Standard Oil Development Co., Elizabeth, N.J. As a member of this consulting group for all Standard Oil Co. (N.J.) refineries, Lang is organizing a trade waste study program as a new activity of the department. Prior to entering the publishing end of the field in 1946, he had served first as San. Engr. for the Pennsylvania Bureau of Parks for two years and then as Chemist for the Newport News, Va., Water Works Com. for a four-year period.

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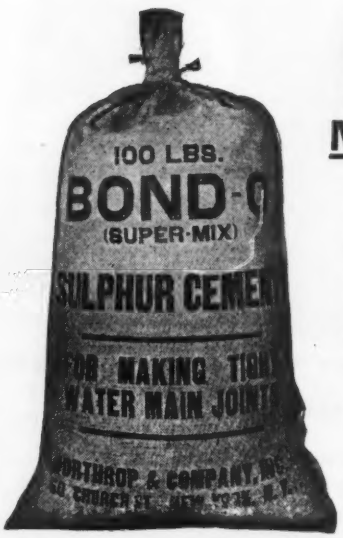

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BOND-O users know that our method of machine-blending is decidedly worth while. This method produces a self-caulking joint compound which is denser in structure, with less shrinkage and practically no initial seepage. Because of the wide distribution of all the minerals, any slight seepage takes up unusually fast. Compare—and you will see the difference.

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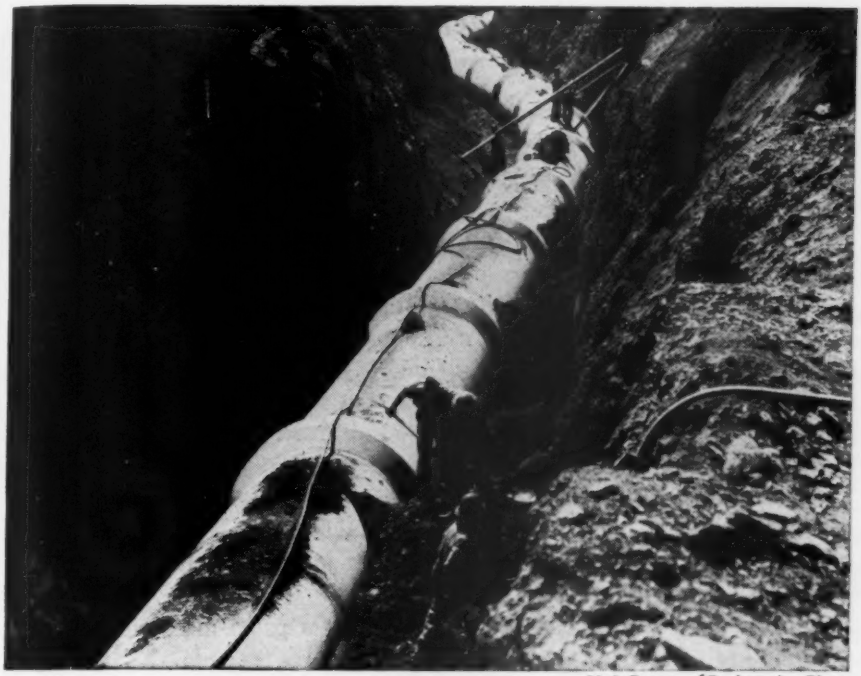


U. S. Bureau of Reclamation Photo

CONCRETE PIPE

meets all requirements for water lines

Large scale installations of water lines for many years have proved that incrustation does not occur to impair the carrying capacity of concrete pipe. Taste, odor and dirty water difficulties are minimized. Concrete pipe meets all other essential requirements for water lines including moderate first cost, structural strength and long life.

Picture shows backfill material being spread in trench for compacting to spring line of 69-in. reinforced concrete pipe on Provo River project near Provo, Utah. The concrete in the project includes 10½ miles of 69-in. pipe. Water is carried 36 miles from the Deer Creek Impounding Reservoir to supplement the water supply of Salt Lake City and serve various irrigation needs.

Project was under direction of E. O. Larson, Regional Director, Region No. 4, U. S. Bureau of Reclamation, Denver, Colo. Construction operations in general charge of L. R. Dunkley, Resident Engineer. General contractor for the concrete pipe, Carl B. Warren of Spokane.

AMERICAN CONCRETE PIPE ASSOCIATION

228 NORTH LASALLE STREET, CHICAGO 1, ILLINOIS

(*Continued from page 56*)

NEW YORK SECTION MEETING

On April 10 and 11, members of the New York Section held their annual spring meeting at the Hotel Statler in Buffalo. A total of 250 water works men attended the various technical sessions and entertainment functions of the two-day program.

Following the opening address of Mayor Bernard J. Dowd of Buffalo, Earl Devendorf, State Water Co-ordinator & Asst. Director, Div. of Sanitation, State Dept. of Health, and former State Mutual Aid Director, reviewed the possibilities of applying the wartime program to peacetime emergencies. His discussion is printed on page 520 *et seq.* of this JOURNAL.

Other speakers of the opening technical session were Jerome C. Kreinheder, Director of Water, Buffalo, and R. N. Aston, Tech. Director, Mathieson Alkali Works, Inc., Niagara Falls. Kreinheder's subject was "The Development and Improvement of the Buffalo Water System." Aston spoke on "The Use of Chlorine Dioxide for Taste and Odor Control." Discussion of the latter presentation was led by Ralph D. Bates, Dist. Engr., State Dept. of Health, Buffalo.

The closing technical session consisted of a panel discussion devoted to the following subjects:

1. Public Relations as You See It
2. Material Shortage Problem—Its Cause and What You Can Do About It
3. Your Experiences in Supplying Water for Air-Conditioning
4. That Problem Which You Meant to Bring up at the Last Meeting

Led by Simon P. Carman, Supt. & Engr., Binghamton Bureau of Water , the discussion of all subjects elicited a lively audience participation. The favorable reception accorded this opportunity for informal discussion of common problems has guaranteed repeat performances at future conventions.

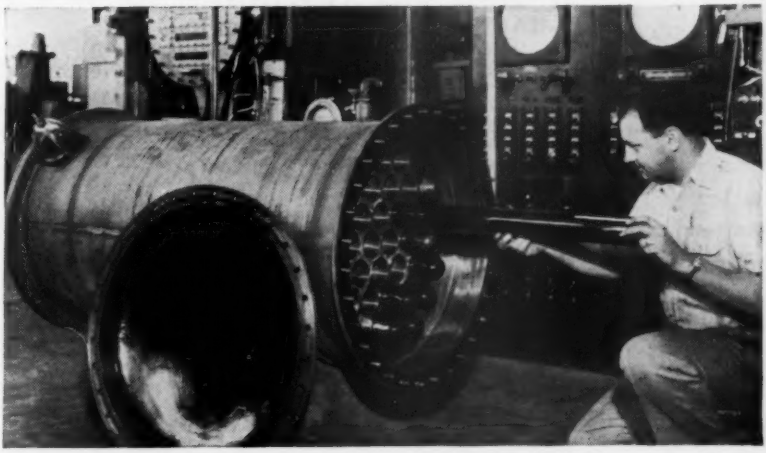
Included as part of the program also were inspection trips to the Buffalo plant of the Worthington Pump & Machinery Corp. and to the Ward Pumping Station and Filtration Plant of the Buffalo Div. of Water.

Feature of the banquet was an address by A.W.W.A. President Wendell R. LaDue, who reviewed the Association's current activities in the public relations field, following which the guests were entertained by a special musical program. Both before and after the banquet, members and guests were given the opportunity to get together informally on a club room basis.

John G. Copley, Gen. Mgr., Elmira Water Board, was selected to receive the section's George Warren Fuller Award for the year.

R. K. BLANCHARD
Secretary-Treasurer

(*Continued on page 60*)



Inserting dielectric tubes into a WELSBACH ozonator preparatory to making a test run at the factory.

Efficiency of *Ozone* in removing phenols from drinking water . . .

Ozone is a most powerful oxidant.

The principal value of ozone in water treatment is its ability to eliminate unpleasant color, tastes, and odors. Ozone is very effective with phenolic pollutions. It introduces no foreign elements into the water.

The WELSBACH ozonator is made of stainless steel incorporating the latest developments in heat-resistant glass and modern electrical equipment.

WELSBACH ozone generators, ranging in capacity from one to 50 pounds per day, can be combined in a simple, compact housing with unit panel control to meet any demand.

WELSBACH

OZONE PROCESSES DIVISION

THE WELSBACH CORPORATION

1500 WALNUT ST. PHILADELPHIA 2

(*Continued from page 58*)

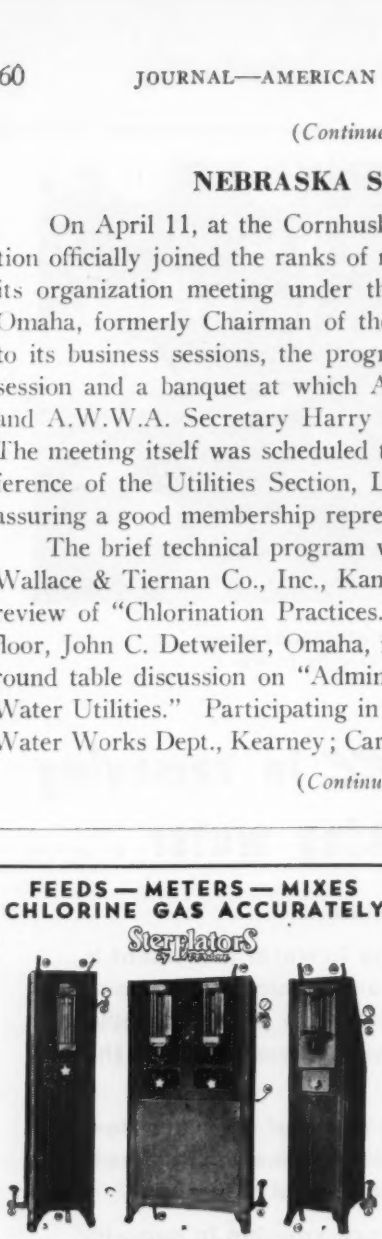
NEBRASKA SECTION MEETING

On April 11, at the Cornhusker Hotel in Lincoln, the Nebraska Section officially joined the ranks of member units of the A.W.W.A., holding its organization meeting under the leadership of Kenneth J. Bunnell of Omaha, formerly Chairman of the Missouri Valley Section. In addition to its business sessions, the program of the meeting included a technical session and a banquet at which A.W.W.A. President-elect N. T. Veatch and A.W.W.A. Secretary Harry E. Jordan gave the principal addresses. The meeting itself was scheduled to coincide with the two-day spring conference of the Utilities Section, League of Nebraska Municipalities, thus assuring a good membership representation for the elections to be held.

The brief technical program was opened by J. A. Strang, Div. Mgr., Wallace & Tiernan Co., Inc., Kansas City, Mo., who gave an informative review of "Chlorination Practices." Following some discussion from the floor, John C. Detweiler, Omaha, introduced and acted as moderator for a round table discussion on "Administration and Management Problems of Water Utilities." Participating in the panel were: Ralph Lancaster, Supt., Water Works Dept., Kearney; Carl L. Fisher, Deputy City Engr., Lincoln;

(*Continued on page 62*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilise a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

SterElators by Everson

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Prevent Rusting

Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.

If your tanks and steel structures are not now protected by this proven low cost method, they should be. No obligation. Send for fully descriptive literature today.

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Here's what engineers say about "Century" ASBESTOS-CEMENT PIPE

"LAID AND TESTED 2100' IN 8 HOURS"

"SOLVES OUR TUBERCULATION PROBLEM"

"LOW FIRST COST . . . ALL-AROUND ECONOMY"

"GREAT RELIEF TO GET MAINTENANCE-FREE LINE"

These are just a few typical comments taken from K&M files on "Century" Asbestos-Cement Pipe. Engineers all over the country have found that "Century" offers a combination of good points that no other type of pipe can offer.

For instance they've found they can hold pumping and maintenance costs to rock bottom with "Century" Pipe. Being non-metallic, "Century" is entirely immune to corrosion, electrolysis and tuberculation. Its Williams and Hazen "C" of 140 remains the same indefinitely.

Engineers have also realized faster, more economical installation, thanks to "Century" Pipe's light weight, long 13' lengths and quickly assembled couplings. They've found that "Century" is strong enough to withstand vibration, traffic and other tough conditions. And, since it grows tougher with age, its salvage value is 100%. Write for further details about "Century" Asbestos-Cement Pipe.

Service connections or connections to other types of pipe are easy with "Century" Asbestos-Cement Pipe.

Nature made Asbestos . . .
Keasbey & Mattison has made it serve mankind since 1873.

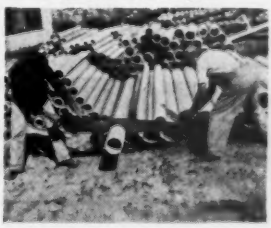
KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

K&M best in asbestos

Reg. U. S. Pat. Off.

Can be drilled and tapped in the field. Note clean-cut threads.

Can be cut on the job.



Easy to handle without mechanical equipment.

(*Continued from page 60*)

Harry Morris, Water & Light Comr., Blair; and Lon D. Wright, Supt., Dept. of Utilities, Fremont. Each contributor discussed the policy of his own municipality in relation to the following questions:

1. What type of top management supervisory control over utility service do you have in your city?
2. What types of treatment or processes are used to prepare the water for your city?
3. What procedures are followed in making water main extensions? How is the work authorized and who pays the cost?
4. What is the practice regarding the placing of fire hydrants on new water main extensions? How does the city pay for fire protection service?

Immediately following the close of the discussion, the business of organization was introduced. Members voted the adoption of the by-laws compiled by the organization committee and elected their officers for the coming year. The session was closed with the reading of numerous congratulatory telegrams and letters greeting the new section.

JOHN W. KRUSE
Secy., Organization Committee

(*Continued on page 64*)

How to join *more* bell and spigot cast iron water mains *per hour* ...*at less cost*

ELIMINATE USE OF HIGH PRICED LEAD

Haymanite JOINTING COMPOUND

Each lb. of Haymanite equals 4 lbs. of lead . . . reduces time, fuel and handling . . . eliminates caulking and large bell holes . . . simple to apply . . . self-sealing when broken.

Immediate deliveries. Free catalog

Producers also of M. H. Brand Caulking Lead

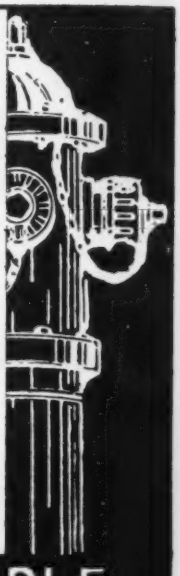
MICHAEL HAYMAN & CO.,
INCORPORATED
ESTABLISHED 1869

862 East Ferry St. Buffalo 11, N. Y.

SERIES 100

- Tested and approved by National Board of Fire Underwriters.
- Conforming to specifications of the American Water Works Association.
- Positive drain and automatic shut off.
- Five sizes from 1¼ to 6″ opening.
- Quick action, simple, easily repaired.
- Send for specification sheets.

JOHN C. KUPFERLE FOUNDRY CO.
St. Louis



KUPFERLE FIRE HYDRANTS

PERMUTIT SPAULDING PRECIPITATOR INCREASES CITY'S CAPACITY FOR TREATING WATER SUPPLY ... AND IN LESS LAND SPACE!

PERMUTIT SPAULDING PRECIPITATOR removes water hardness, dirt and color by the sludge blanket process. This new-design equipment cuts detention time, saves chemicals, takes only half space of former methods.

Expansion of municipal water softening capacity need not mean relocation of water works, or even extra space. The Permutit* Spaulding Precipitator, which increases the rate of flow, actually requires *less* space than former methods and provides, in addition, greater economy of operation than was previously possible.

In your blueprints for water improvement, recommend modernization of *present* municipal systems with space-saving, time-saving Permutit Water Conditioning Equipment. There is no more efficient way to meet the needs of citizens and industry for soft water in tomorrow's community. For complete details, address The Permutit Company, Dept. JA6, 330 West 42nd Street, New York 18, N. Y. or Permutit Co. of Canada, Ltd., Montreal.

*Trademark Reg. U.S. Pat. Off.

PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 62*)

Ozone Processes, Inc., on May 1, changed its status from wholly owned subsidiary of the Welsbach Engineering & Management Corp. to operating division of the reorganized parent corporation. Reorganization involved a change of name to the Welsbach Corp. and merger with all wholly owned domestic subsidiaries.

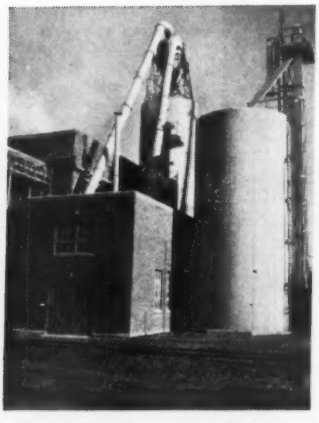
Liquid Conditioning Corp., Linden, N.J., recently issued three new bulletins describing different types of water treatment equipment and processes: Bul. 6—Iron and Manganese Removal; Bul. 7—Silica Removal; and Bul. 8—Swimming Pool Filters. Copies of any or all may be obtained by addressing the company's Dept. JA at 114 E. Price St., Linden, New Jersey.

Rusta Restor Div., The Johnston & Jennings Co., Cleveland, Ohio, has announced the appointment of George L. Fox as Sales Manager to succeed A. B. MacTaggart, who is retiring from sales work to devote his full time to research and development. Fox formerly represented the company in Michigan and then in Ohio.

(*Continued on page 66*)

Be Sure to Specify CYANAMID

SULPHATE OF ALUMINA



Partial exterior view of Cyanamid's new alum plant at Hamilton, Ohio. As at other Cyanamid plants, rigid control methods assure highest quality Sulphate of Alumina

CYANAMID'S uniform high quality of product assures you:

maximum removal of taste and odor

maximum freedom of flow

maximum pH range of precipitation (much wider than other coagulants)

minimum corrosion of equipment (much less than other coagulants)

no clogging of dry feed machines

Your inquiries are welcome. Address our nearest office.

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District Offices: Boston, Mass. • Philadelphia, Pa. • Baltimore, Md. • Charlotte, N. C. • Cleveland, Ohio
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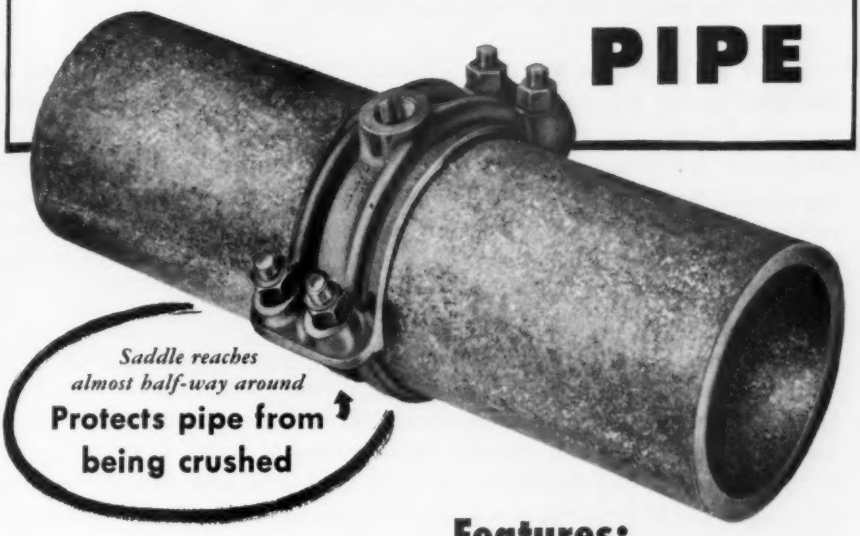
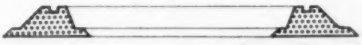
NEW! SAFE! Service Clamp for Cement-Asbestos PIPE



This New Smith-Blair Bronze Service Clamp has been designed especially for the requirements of Class 150 and Class 200 Transite or Century pipe. Its saddle reaches almost half-way around the pipe eliminating the possibility of saddle corners gouging into the pipe. Flat straps in either duronze or iron are standard; also furnished with zinc plated or round straps.



Special Gasket is bonded to the saddle. Regardless of how rough the pipe may be, this extra-soft, extra-thick molded rubber gasket effects a positive permanent seal.

Immediate Delivery!

Stocks in Principal Cities, write for name of your nearest Distributor.

Features:

Tests have shown that it is exceedingly difficult to damage pipe with this Smith-Blair Service Clamp (when flat straps are used).

Designed in double-strap style only for use on 4", 6" and 8" nominal Class 150 Cement-Asbestos, and Class 200 Transite or Century pipe.

Tapped for ½", ⅜", ¾", 1", 1¼", 1½" and 2" iron pipe or corporation threads. Specify sizes wanted when ordering.

SMITH
Water works supplies and specialties
BLAIR
INC.

SOUTH SAN FRANCISCO • CALIFORNIA

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

(*Continued from page 64*)

Latta & Fent will be the name of a new firm of consulting ground water geologists to be established July 1 with offices in Salina, Kan. The firm is to specialize in water supply surveys and test drilling for municipal, industrial, railroad and irrigation supplies. Partners in the new organization are Bruce F. Latta, formerly Assoc. Geologist, Div. of Ground Water, U.S. Geological Survey, and O. S. Fent, formerly Geologist and Test Drilling Supervisor, Kansas Geological Survey.

The A. P. Smith Mfg. Co., East Orange, N.J., has developed a new lead gasket for use on bolted tapping sleeves. The gasket, which has raised preformed ribs, covers the full length and width of the flange. When the sleeve halves are assembled on the main, the raised ribs are compressed first; then the balance of the gasket is compressed to assure a permanently tight leak-proof assembly, free from strains and casting distortion. All new Smith bolted tapping sleeves are being equipped with the new device.

Peerless Pump Div., Food Machinery Corp., Los Angeles, recently announced a new "Mixed Flow" type pump which can be effectively applied to numerous de-watering, flood control, agricultural and industrial service projects, requiring moving or removing of water in capacities up to 220,000 gpm. As described and illustrated in a new 24-page bulletin, the pump, which embodies the essential characteristics of both centrifugal and axial flow types, can move liquids against maximum heads with minimum submergence, can be adapted to shallower sumps, can utilize higher speed motors against medium heads, and can be installed in minimum space. Featured are a full description, typical and unusual installations, applications and engineering advantages, cross-sectional drawings, engineering data and diagramatic sketches of pumping station arrangements. Copies may be obtained by requesting Bulletin No. B-148 from the division office at 301 W. Ave. 26, Los Angeles 31.

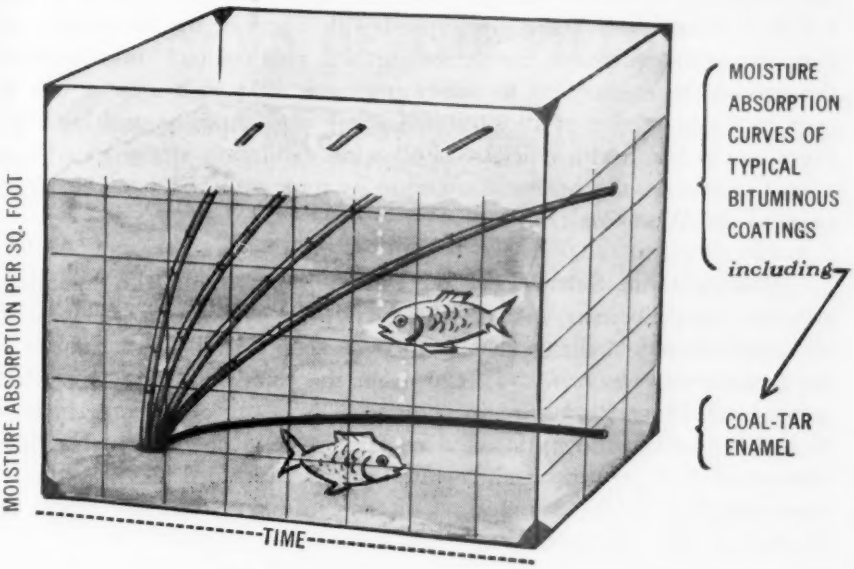
(*Continued on page 68*)

ZECO
GREENSAND
ZEOLITE

ZECO and HI–ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.
90 WEST STREET **NEW YORK 6, N. Y.**

Stable Electrical Insulation



Barrett Coal-tar Enamels, because of their resistance to moisture absorption, provide an efficient electrical insulation over long periods of time.

Their high dielectric strength makes cathodic protection economical. Aware of this, engineers are today designing corrosion-proof pipelines, using protective coatings which have high electrical insulation values and require less current and equipment per mile of pipeline to make cathodic protection economical.

Over a period of many years Barrett Coal-tar Enamels have demonstrated their ability to resist electro-chemical corrosion, because of their inherent insulation value.

* * *

FIELD SERVICE — The Barrett Pipeline Service Department and staff of Field Service men are equipped to provide both technical and on-the-job assistance in the use of Barrett Enamel.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Barrett
COAL-TAR ENAMEL
Reg. U. S. Pat. Off.

(*Continued from page 66*)

Proportioneers, Inc., Providence, R.I., has despatched a brand new demonstration trailer on a cross-country tour, scheduled to arrive in San Francisco in time for the July 21 opening of the joint A.W.W.A. and F.S.W.A. Conference there. Equipped with many of the latest types of Proportioneers equipment, the trailer unit will visit company branch offices throughout the country on its westward route. At each stop it will be open to the inspection of all interested water works men, consulting engineers and public health officials. Following exhibition at the San Francisco Conference, the unit will continue its tour with visits to the larger cities of the West Coast.

Pennsylvania Salt Mfg. Co., Philadelphia, made the headlines recently when Secretary of the Treasury John W. Snyder reported its co-operation with the President's price reduction campaign. Subject of the Secretary's release was a letter from the company's president which pointed out Pennsalt's record in holding its prices to an average increase of 11.3 per cent in the six years since January 1941, as compared with an increase of 31.7 per cent in all chemical prices. Included also was the announcement of a May 1 reduction of $5 per ton in company prices for chloride of lime and anhydrous ferric chloride.

On Call . . .
to tell your story for you!

Willing Water wants work on or as your public relations staff. Let him be your spokesman to your customers . . . to your personnel. You'll find him a master of the art of putting across your ideas...of soliciting co-operation ...of establishing good will. Call him up...put him to work on your publicity, your signs, your bulletins, your bills, your reports...you'll find him ready, able and, of course, willing.

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500 Fifth Avenue • New York 18, New York

NEWS OF THE FIELD

The Association's new officers who will take over the reins at the San Francisco Conference on July 25 are:

President—N. T. Veatch, Partner, Black & Veatch, Cons. Engrs., Kansas City, Mo. Born in Rushville, Ill., in 1886, Veatch was educated at the University of Kansas, receiving his BS degree in 1909 and a degree in civil engineering fifteen years later. While still an undergraduate, he received his introductory experience in engineering, first with the Santa Fe Railroad and later with the U.S. Dept. of Agriculture, assisting in the conduct of drainage surveys. Immediately upon graduation he joined the consulting engineering firm of Worley & Black, predecessors to the firm of which he is now a partner.

In the first four years of his professional career, Veatch managed to do all the job sampling that he required before settling down in the consulting engineering field. First he spent a year with Worley & Black as resident engineer on the construction of electric light and water plants in Kansas. Then he returned to the university as an instructor and an assistant engineer with the Kansas State Board of Health on water and sewage problems. A year later he returned to Worley & Black to become resident engineer on a construction project at Hill City, Kan. In 1912 he left the firm again to accept employment with the American Water Works & Guarantee Co. of Pittsburgh, Pa., where, after a few months' indoctrination, he received an assignment as Supt. of the Keokuk, Iowa, Water Works.

Finally, in 1913, Veatch went back to the Worley & Black organization to stay. Appointed Principal Asst. Engr. upon his return, he worked for two years in that capacity; and, in 1915, joined E. B. Black in taking over the practice of the firm under its present name of Black & Veatch. Since that time, the firm, which has specialized in sanitary, electric, mechanical and valuation engineering, has grown to a present staff of more than 125 engineers, technicians, draftsmen and other employees, with a record of more than 500 water works projects of all sizes and kinds distributed throughout the United States and its possessions.

A member of the A.W.W.A. since 1915, Veatch has a long record of active participation in Association affairs, beginning when he was one of the petitioners for the creation of the Missouri Valley Section, recently broken down into component state sections. As chairman of that section in 1937 and later as its representative on the Board of Directors, he became active too in the national organization, with appointments to the Committee

(*Continued on page 2*)

(*Continued from page 1*)

on Water Works Practice, the Committee on Steel Standpipes and Elevated Tanks, and the Committee on Valuation. As Vice-President during the past year, he also made many contributions to the promotion of the Association and its activities.

In taking over the President's gavel from Wendell R. LaDue at San Francisco, Veatch will bring to the office a long record of interest and achievement in the field. A registered professional engineer in nineteen states, a member and officer of a number of other technical socities and a consultant on numerous projects throughout the country, he is eminently qualified to give personal direction to the varied activities of the Association.

Vice-President—Linn H. Enslow, Editor, *Water & Sewage Works.* Born in Richmond, Va., in 1891, Enslow graduated from Virginia Polytechnic Inst. in 1912, with an industrial chemistry degree. Immediately following his graduation, he accepted a job as Asst. Works Chemist with the General Chemical Co. In 1914 he left that company to join the chemistry staff of the Maryland State Health Dept., on a part-time basis at first while he took graduate courses in chemistry at Johns Hopkins Univ., and later as full-time Asst. Chemist in charge of the water and sewage laboratory. In 1918 he became Chemist in Charge of Filtration at Spartanburg, S.C., leaving a year later to accept a position as chemist at the Panama Canal, where he also supervised the filter plant at Gatun, C.Z. From 1920 to 1925, he was Asst. Engr. with the Virginia State Dept. of Health.

His work in New York began in 1925 when he was appointed Research Engr. for the Chlorine Inst. Six years later he accepted his present position with the Gillette Publishing Co., of which he has been Vice-President since 1933. He continues his connection with the Chlorine Inst. as a consultant.

An Association member since 1918, Enslow began to be active in its affairs in 1933 when he was appointed Vice-Chairman of the Publication Committee. With his elevation to chairmanship of that committee in 1936, he became ex officio a member of the Board of Directors. In 1936, also, he became ex officio a member of the Convention Management Committee and Vice-Chairman of the Diven Award Committee. In the same capacity he has served since 1939 on the Executive Committee of the Board.

Enslow was honored by the Association at its Cincinnati Convention in 1935 by presentation of the John M. Diven Medal.

(*Continued on page 3*)

(*Continued from page 2*)

Treasurer—William W. Brush, Editor, *Water Works Engineering.* Born in Orange, N.J., in 1874, Brush is a New Yorker from "way back." Following his graduation from New York University, where he received both bachelor's and master's degrees in civil engineering, he went to work for the Brooklyn Water Dept. in 1894, transferring to the New York Board of Water Supply in 1907. For 27 years, until he took over his present position in 1934, Brush served first as Engr. and later as Chief Engr. of that department.

A member of the A.W.W.A. since 1911 and an Honorary Member since 1937, Brush has been an officer of the Association continuously since 1922, when he was first elected Treasurer. His tenure in that office has been interrupted only for the two-year period in 1928 and 1929 when he served successively as Vice-President and President. During his quarter century in office, Brush has served on innumerable technical and administrative committees, and ex officio as a member of both the Board of Directors and its Executive Committee.

Brush was awarded the John M. Diven Medal for outstanding service to the Association at the Memphis Convention in 1932.

New members of the Board of Directors, elected during the past year by various local sections for three-year terms beginning on the last day of the San Francisco Conference, are:

Alabama-Mississippi Section—A. Clinton Decker, San. Engr., Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Born in Prince Bay, N.Y., in 1886, and educated at Cornell Univ., from which he graduated with a civil engineering degree in 1909, Decker entered the water works field immediately upon completing his education, becoming Chemist & Bacteriologist for the East Jersey Water Co., Little Falls, N.J. A year later he headed south to take a similar job with the Birmingham, Ala., Water Works Co., working there for two years before he took over his present position in 1912.

In conjunction with the work he has done as sanitary engineer for the past 35 years, Decker served as a member of the engineering commission of the Birmingham Industrial Water Supply in 1932–39 and has been con-

(*Continued on page 4*)

(*Continued from page 3*)

sultant on water supply, sewerage and sewage treatment for a number of private and public organizations throughout the Southeast from 1932 to the present time.

A member of the Association since June 1914, Decker was Vice-Chairman of the Water Purification Division in 1942–1943, then Chairman in 1943–1944. He has also been Editorial Chairman of the committee charged with the revision of the *Manual of Water Quality and Treatment* since 1944.

Iowa Section—Dale L. Maffitt, Gen. Mgr. Des Moines Water Works. A Des Moines man right down the line, Maffitt was born in the city in 1892, graduated from Drake Univ. there in 1914 and has been a member of the city's water works staff ever since, with a brief leave of absence to do graduate work in chemistry and chemical engineering at the Massachusetts Inst. of Technology in 1920–1921. Appointed Asst. Chemist in 1914, he was promoted to Chief Chemist in 1916, became Asst. Gen. Mgr. in 1926 and finally was appointed to his present position in May 1933.

Maffitt has been an Active Member of the A.W.W.A. since April 1918. In 1938 he was elected Chairman of the Missouri Valley Section and Vice-Chairman of the Association's Finance and Accounting Div., moving up to Chairman of the division in 1940. Chairman of the Committee on Pensions and Retirement Plans, he is also a member of the following committees: Water Works Practice; Municipal Water Works Organization; Fire Prevention and Protection; Survival and Retirement Experience With Water Works Facilities; and Federal Activities.

(*Continued on page 6*)

"Meet me at the Well"

In the Main Arena of the San Francisco Civic Auditorium

when A.W.W.A. and F.S.W.A. members turn out en masse to see what's new, talk shop, renew acquaintances, swap ideas at their joint annual conventions, from—

July 21 to July 25, 1947

The Smith-Blair Repair Clamp is especially flexible . . . so much so that it easily adjusts itself to any pipe shape . . . being of "non-rigid" design it cannot distort or crush thin-walled or weakened pipe. On standard, riveted, O. D., cast iron or asbestos cement pipe it's the "snuggest-fitting" leak clamp yet!

Smith-Blair Distributors

ARIZONA—Phoenix & Tucson, Crane Co.
ARKANSAS—Ft. Smith, Crane Co.
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San Diego, Industries Sup. Co. (San Diego & Imp. Ctys.)
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Los Angeles, Crane Co. (Los Angeles Cty.)
Los Angeles, Western W. Wks. Sup. Co. (Los Angeles Cty.)
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COLORADO—Denver, Thompson Pipe & Steel Co., also part of Wyoming and New Mexico.
GEORGIA—Thomasville, Davis Meter Repair Co. for Miss., Ala., Fla., & Georgia.
IDAHO—(See Oregon).
KANSAS & MISSOURI—Kansas City, Kansas, F. L. Carswell Mfg. Co.
MICHIGAN—Birmingham, Ellis & Ford Mfg. Co. for Mich., Ohio, Ill., Ind., & Wisc.
MONTANA—(See Oregon).
NEBRASKA—Lincoln, Western Supply Co.
NEW YORK—Brooklyn, J. G. Pollard Co., Inc. for N. Y., N. J., Penn., New England States.
OKLAHOMA—Tulsa, Crane Co., (East Okla.) Okla. City, Crane Co., (West Okla.)
OREGON—Portland, Waterworks Supplies Co. for Ore., No. Idaho, Washington Counties of Pacific, Cowlitz, Skamania, Klickitat.
SO. CAROLINA—Sumter, Cities Supply Co., Inc. for Virginia, No. & So. Carolina.
TENNESSEE—Memphis, Viking Supply Co.
TEXAS—Waco, Rohan Co. (entire state).
UTAH—Salt Lake City, Waterworks Equip. Co., for Utah and So. Idaho.
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Other advantages you'll like—

1. **NO HINGES TO BREAK OR BIND**
2. **MAKES A PERMANENT REPAIR**
3. **ALMOST 100% WRAP-AROUND**
4. **EASIER TO HANDLE, QUICKLY INSTALLED**
5. **SAFEST TO USE ON WEAKENED PIPE**
6. **EQUALIZES ITSELF OVER IRREGULARITIES**

Furnished in all sizes ½" through 24" O. D. Band widths to 30 inches in multiples of 3 inches. Specify if for LOW, MEDIUM, OR HIGH PRESSURE when ordering.

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Water works supplies and specialties
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SOUTH SAN FRANCISCO • CALIFORNIA

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

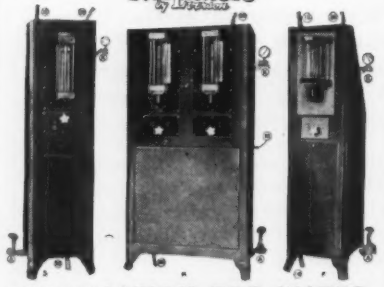
(*Continued from page 4*)

Kentucky-Tennessee Section—Claude Manley McCord Sr., Director, Water Div., Memphis, Tenn. Born in 1886 at Jackson, Ga., McCord attended the Georgia School of Technology, graduating with a BS in Electrical Engineering in 1906. Following graduation he spent a year with the Southern Bell Telephone & Telegraph Co. before entering the water works field as Supt., Light & Water Dept., Senatobia, Miss., in 1907. A year later he left to spend four years at electrical contracting and designing work, returning to the field for another year in 1913 as Supt., Light & Water Dept., Atlantic Beach, Fla. From 1914 through 1932 he concentrated primarily on electrical engineering work. Finally in 1933 he left a job as President of the Separator Mfg. Co in Memphis to become Gen. Supt. of the Memphis Water Dept. Remaining with that department, he was appointed to his present position in 1940.

(*Continued on page 8*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

SterElators by Everson



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

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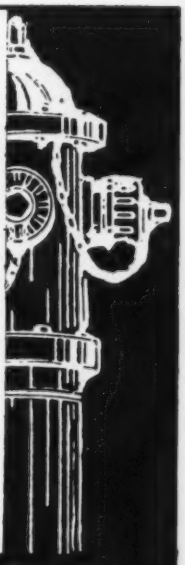
SERIES 100

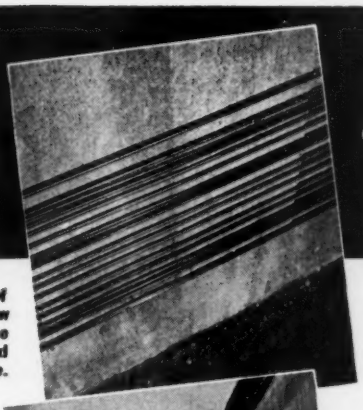
- Tested and approved by National Board of Fire Underwriters.
- Conforming to specifications of the American Water Works Association.
- Positive drain and automatic shut off.
- Five sizes from 1¼ to 6" opening.
- Quick action, simple, easily repaired.
- Send for specification sheets.

JOHN C. KUPFERLE FOUNDRY CO.
St. Louis



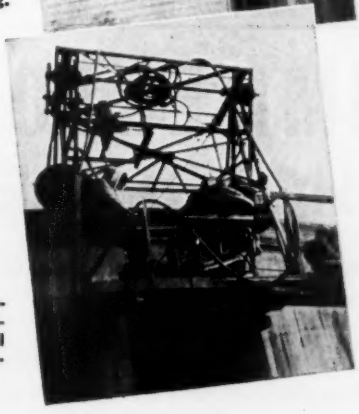
KUPFERLE
FIRE HYDRANTS

Prestressed TANKS



A section of the first few turns of the prestressed wire in place.

Preloader prestressing high tensile strength wire on dome ring.



Preloader operator maintains control over wire tension.

THIRTY-FIVE MILES OF "PIANO" WIRE BALANCES THE LOAD ON TYPICAL WATER STORAGE TANK

Wire Prestressing with the automatic PRELOADER is being used on the 1,000,000 gallon water storage tank illustrated above and built for the U.S. Army Engineers at the Middletown, Pa. Air Depot by the Preload Corporation.

For a permanent army installation this prestressed tank illustrates a type of water storage which can virtually be "built and forgotten" as it will not require painting and will have little or no maintenance cost.

PRELOAD WIRE PRESTRESSING is a machine job making other methods obsolete. The wire winding machine eliminates guess work. There is close control of the tension on the wire as it passes through the wire stressing mechanism which imposes a constant predetermined stress on the wire during application, unaffected by temperature variations during construction.

For circular tanks for water storage, filtration, or sewage disposal plants PRELOAD PRESTRESSED construction offers specific economies in original cost per gallon and substantial savings over other types of construction in concrete and and steel quantities. Materials shortages do not affect construction of these tanks. They can be built immediately using local materials and labor. We have high tensile strength wire and vertical prestressed reinforcing rods in stock.

Write for our literature and send us your tank problem

THE **PRELOAD** CORPORATION

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Designers and Builders of Prestressed Concrete Structures. Prestressed Concrete Storage Tanks and Pressure Pipe. Cement Lining 24" Pipe and larger.

(*Continued from page 6*)

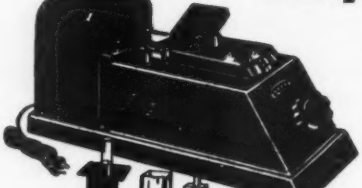
McCord's A.W.W.A. membership dates from 1933. He is a member of the Committee on Deep Wells and Deep Well Pumps. Active in section activities, he was presented with the George Warren Fuller Award in 1943.

Michigan Section—Rene J. LaMarre, Supervisor of Filtration, Springwells Station, Detroit Dept. of Water Supply, Dearborn. Born in Alpena, Mich., in 1899, LaMarre received his education at the Detroit Inst. of Technology, Univ. of Michigan and Wayne Univ. Following his graduation he joined the staff of Dow Chemical Co., Midland, as an analyst. Then in 1923 he became Chemist & Bacteriologist at the Detroit Dept. of Water Supply Water Works Park Station, remaining in that job until his appointment to his present position at the Springwells Station in 1931.

LaMarre became an Active Member of the Association in 1935 and was Chairman of the Michigan Section in 1940.

(*Continued on page 10*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER



Adaptable for Use in Water Analysis

Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

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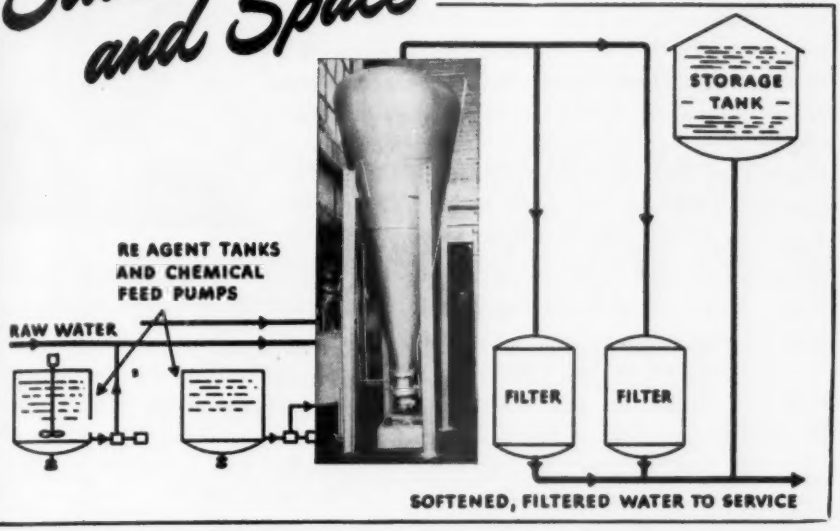
NEW SLUDGELESS WATER SOFTENER...

Saves time and Space



Permutit* Spiractor applies established principles in a new way

Permutit's Spiractor—latest addition to modern cold lime or lime soda water treatment—operates on the principle of intimate contact with solid nuclei for accelerated precipitation. The conical container—itself a great saving in space over other type systems—is more than half filled with fine granules of calcium carbonate catalyst. Hard water and lime soda precipitant enter at bottom, mix at once, flow upward through catalyst bed. This tangential inflow gives a rising swirling motion that greatly speeds softening reaction by affording immediate contact between chemically treated water and suspended granules.

Precipitated hardness deposits on the surface of these granules which increase in size. There is no watery sludge; the enlarged granules are readily disposed of like moist sand grains. Detention period of the Spiractor is only five to ten minutes.

For more information write the Permutit Company, Dept. JA7, 330 West 42nd St., New York 18, N. Y. or Permutit Co, of Canada, Ltd., Montreal.

* Trademark Reg. U. S. Pat. Off.

PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 8*)

Missouri Section—W. Victor Weir, Pres., St. Louis County Water Co., & Pres., Missouri Water Co., University City. Born in Warren, Ind., in 1902, Weir was educated at Washington Univ., receiving a BS degree in civil engineering in 1923. Graduation projected him immediately into a job as Jr. Engr. with the West St. Louis Water & Light Co., predecessor to the St. Louis County Water Co., of which he is now president. Through his continuous service with the organization Weir has held the positions of Engr., Asst. Mgr., Chief Engr., Supt., Vice-Pres. & Gen. Mgr., culminating in his election to presidency last year. Concurrently he was successively Supt., Vice-Pres. & Gen. Mgr., and President of the Missouri Water Co., which has systems in Lexington and Independence, Mo.

A member of the A.W.W.A. since July 1924, Weir has been exceptionally active in the affairs both of his section and the parent organization. A former Chairman of the Missouri Valley Section, of the Plant Manage-

(*Continued on page 12*)

M H

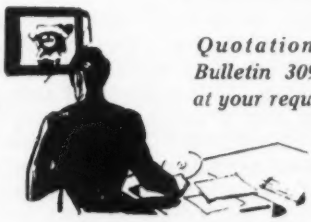
HIGH QUALITY VALVES HYDRANTS

M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

SPARLING

Main-Line Meters

Consistent Accuracy
Ease of Installation
and Maintenance
Low Pressure Loss



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R. W. SPARLING Manufacturers of WATER MEASURING EQUIPMENT

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YOUR WATER SUPPLY

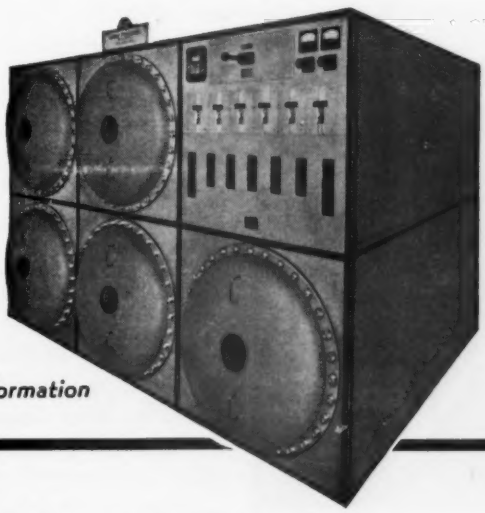
Complaints or Compliments?

It may be no longer necessary to endure endless complaints from bad tastes and odors in your water supply.

Ozonation might solve this problem by oxidation. Tastes and odors from industrial pollution, algae and decayed vegetation are definitely reduced and often completely eliminated.

Taste and odor removal is not all—Ozonation has a plus value,—it is also a powerful germicide.

The net cost of Ozonation is surprisingly low in view of the great improvements it brings and the chemicals it saves.



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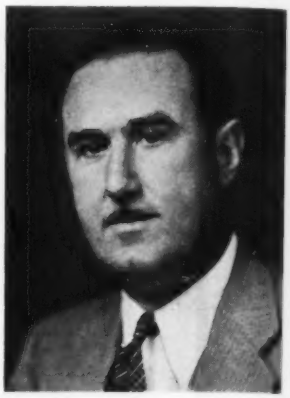
(*Continued from page 10*)

ment & Operating Div. and of the Finance & Accounting Div., he is now Chairman of the Committee on Location Records and Maintenance of Mains and Services and A.W.W.A. representative on the ASA Committee Z32 on Standardization of Graphical Symbols for Use on Drawings. He is also a member of the Water Works Practice, Publication, Public Relations, *Manual of Water Quality & Treatment* and Meters Committees.

Weir was honored by the Association in 1940 by presentation of the John M. Diven Medal and by his section in 1943 when he was selected to receive its George Warren Fuller Award.



Nebraska Section—John C. Detweiler, Water Engr., Metropolitan Utilities Dist., Omaha. A native of Omaha since his birth there in 1899, Detweiler graduated from the Univ. of Nebraska with a civil engineering degree in 1922. Following a period of intermittent employment with the Metropolitan Utilities Dist. dating from 1923, he accepted a full-time job there in 1929. In his present capacity he is in charge of all water treatment and distribution for that organization.

A member of the A.W.W.A. since 1930, Detweiler held office as Chairman of the Missouri Valley Section, which has since been broken down into individual state units. He has also been active in Association affairs as a member of the Committees on Service Line Materials and on Location Records and Maintenance of Mains and Services.

New England Section—Percy A. Shaw, Supt. & Chief Engr., Manchester, N.H., Water Works. Born in Athol, S.D., in 1884, Shaw graduated from Brown Univ. with a civil engineering degree in 1908. In the same year he began a 25-year consulting engineering career with the firm of F. H. Shaw, Lancaster, Pa. Remaining with that organization first as Designing Engr. and later Mng. Partner until 1917, he next joined L. H. Shattuck, Inc., working there as Asst. Engr. and then Chief Engr. until 1927. Following brief associations with the U.G.I. Contracting Co. and the Trojan Engineers, he established his own practice in 1933 giving it up the following year to take over his present position at Manchester. A member of the Association since 1934, Shaw was Chairman of his section in 1941.

(*Continued on page 14*)

WF

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(*Continued from page 12*)

New Jersey Section—Charles H. Capen, Chief Engr., North Jersey Dist. Water Supply Com., Wanaque. Born in Jersey City in 1895, Capen attended Cornell University, graduating with a civil engineering degree in 1917, at which time he became Asst. San. Engr. with the New Jersey State Dept. of Health. For the year 1918, he was assistant to Nicholas S. Hill, Cons. Engr., following which he returned to the health department as Asst. Engr. Appointed Engr. with the North Jersey Dist. Water Supply Com. in 1925, Capen worked on the design and operation of the Wanaque system until 1941, when he left for a year to become San. Engr. with the New York Dist. U.S. Engineer. He was appointed to his present position in 1942.

A member of the A.W.W.A. since 1930, Capen received his section's Fuller Award in 1938 and was elected Section Chairman in 1941. A member of the Publication Committee and the Committee on Sluice Gates, he is also Adviser of the Committee on Water Consumption.

(*Continued on page 16*)

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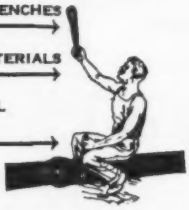

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(*Continued from page 14*)

New York Section—Wallace T. Miller, Supt., Board of Water Comrs., Ossining. Born in Flushing, N.Y., in 1904, Miller was graduated from New York University in 1926. He immediately accepted employment with the village of Ossining, N.Y., as Construction Engr., holding that post until he was appointed to his present job in 1933. During the war, he took military leave for three years to serve as Asst. Civ. Engr. and Public Works Officer with the Navy Civil Engineering Corps.

A member of the A.W.W.A. since 1933, Miller has served as New York Section Trustee since 1940 and as Chairman of the Section in 1943 and 1946.

Pacific-Northwest Section—Walter J. Moore, Water Supt., Eugene, Ore., Water Board. Born in Sterling, Neb., in 1886, Moore went west with his family completing his high school work at Eugene and attending the Univ. of Oregon there. Following his graduation in 1908, he worked at various construction jobs until 1915, when he became a secondary school teacher of mathematics and physics. For the ten years during which he taught at various Oregon and Washington schools he continued to practice engineering during summer vactions until an offer by the Eugene Water Board lured him away from the schools system in 1925. Since that time he has served continuously with the municipality, being promoted from engineer to superintendent of the water department in 1932.

(*Continued on page 18*)

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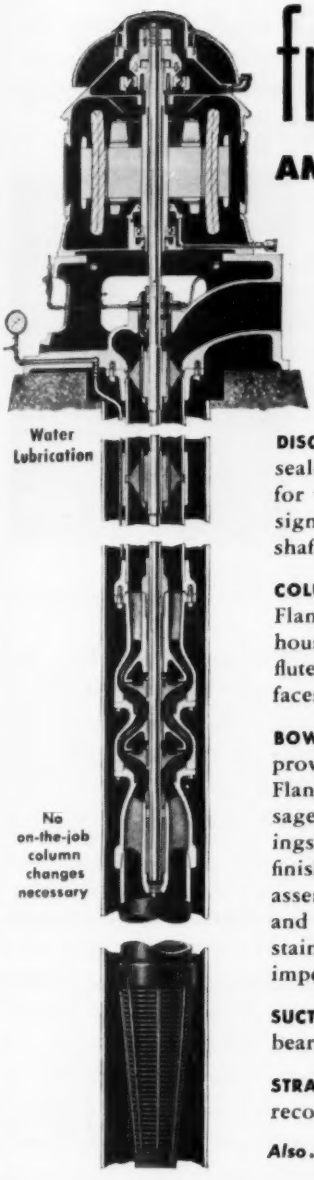

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(*Continued from page 16*)

As a representative of the Board, Moore has been active in Association affairs for many years. In 1942–1943, he was Chairman of the Pacific-Northwest Section and in 1946 he was presented with its George Warren Fuller Award.

Western Pennsylvania Section—Myron G. Mansfield, Cons. Civ. & San. Engr. of Morris Knowles, Inc., Pittsburgh. A New Yorker by birth and education, Mansfield has spent his entire career to date in Pennsylvania. Following his graduation from Syracuse Univ. in 1913, he spent two years as engineer with the Pittsburgh Railway Co. Then after a year as Engr. at the York Sewage Treatment Plant, he became associated with the Morris Knowles organization in 1916 as a consultant. Having worked with the firm continuously since that time, Mansfield was made Division Engr. & Secretary in 1922 and in 1933 took over the post of Vice-President in addition to his other duties.

A member of the A.W.W.A. since June 1924, Mansfield has been active in section affairs for a number of years. Elected Trustee of the Central States Section in 1938, before formation of the Western Pennsylvania Section, he served in that capacity in the new section in 1939 and 1940. In 1941 and 1942, he was successively Vice-Chairman and Chairman of the section and in 1943 he was honored with presentation of its George Warren Fuller Award.

Manufacturer—Willard F. Rockwell, Chairman of the Board, Rockwell Mfg. Co., Pittsburgh. Born in Boston, Mass., in 1888, Rockwell received his education at the Massachusetts Inst. of Technology, graduating in 1908. A consulting engineer since 1914, he began his career in manufacturing with his election to vice-presidency of the Torbensen Axle Co. of Cleveland in 1918. Since that time he has served as president, director, and chairman of the board for numerous other firms, and still holds membership on the board of directors of a number of banks and corporations. His major occupation has been his direct supervision of the affairs of the Pittsburgh Equitable Meter Co., which in December 1945 was renamed

(*Continued on page 20*)

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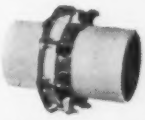

Adjustable Bell-Joint Clamps (Style 60) for repairing and preventing leaks in bell-and-spigot joints. Sizes 3" to 60" CIP.

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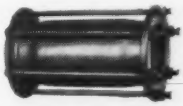

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(*Continued from page 18*)

the Rockwell Mfg. Co. As President from 1926 until the early part of this year, and as Chairman of the Board since 1944, Rockwell has seen the firm grow until it now controls some twelve divisions and subsidiaries in the field.

A member of the A.W.W.A. since February 1928, Rockwell is also a member of the Board of Governors of the Water & Sewage Works Manufacturers Assn.

Frank A. Barbour, 1870–1947

On a Massachusetts May afternoon, three men, whose friendship had weathered many years, were enjoying a Saturday game of golf. Two stood by, waiting for their friend to putt. The pause before he stroked the ball was longer than usual. And as they watched they saw Frank Barbour fall. His heart had failed him; the game was over.

Those who knew Barbour, those who admired and understood him, are certain that, if he could have, he would have chosen just such an end to his earthly life. His was a dynamic and forthright personality; he was a man who held his views firmly and with assurance, a man who commanded the respect of his associates in the engineering field as well as of the state and municipal executives who sought his counsel.

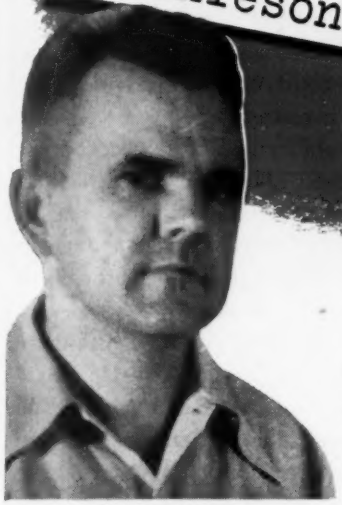
A native of New Brunswick, Barbour was a graduate of the University of New Brunswick. His entry into the water works field was through the Boston Water Department. His consulting engineering contacts covered many cities in many states. His name and his work are known throughout the field.

In his term as President of the American Water Works Association in 1935–1936, there fell to him the task of guiding the administrative reorganization of that period. His performance of that task as well as his many other contributions to the Association earned him his election to Honorary Membership in 1939, just as his parallel efforts were rewarded by Honorary Membership in the New England Water Works Association.

In the death of Frank Barbour, the water works field has lost one of its most gifted and striking personalities. Those who knew him will always remember him as a positive and forthright individual—a man who was guided by the highest standards and never doubted for a moment the validity of the opinions which he held.

(*Continued on page 22*)

another taste and odor problem solved by Mathieson Chlorine Dioxide!



Major C. Hagar

Water Superintendent Major C. Hagar of the City of Lawrence, Kansas, and his staff testify that the cost of Mathieson ClO_2 treatment is small considering its enthusiastic reception by consumers.

During January and February, 1946, melting snow and ice created especially unpleasant tastes and odors in the Kaw River, water supply for the City of Lawrence, Kansas. Yet, the Mathieson Chlorine- Chlorine Dioxide water treatment was able to cope with even that extreme condition.

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Mathieson
CHLORINE DIOXIDE

(*Continued from page 20*)

At Oneida, N.Y., and four small nearby communities, 20,000 people were placed on emergency water rations June 1 after a chain explosion leveled the chlorination station at the Glenmore Reservoir, making the whole area dependent on the three-day supply stored in Oneida's Baker Reservoir at the time. Although some of the early newspaper stories reported the explosion of chlorine tanks in the blasts which shook a 25-mile area, shattering farmhouse windows and hurling pieces of chemical containers some 300 ft., information from water department officials indicates that only the ammonia cylinders were involved.

The station razed by the explosion and fire was a wooden structure approximately 15 x 20 ft. in size, with an asbestos shingle roof. At one side of the building, a wooden lean-to had been constructed to provide additional storage space. Although preliminary investigation of the site by water department personnel suggested the possibility that fire preceded the explosion, it was difficult to find a likely cause. The coal stove heating system was not in use at the time of the accident and the only other possible source appeared to be an incandescent light bulb hanging on an extension cord to warm the chlorine gas line behind the tray of the chlorinator. All other electric wiring was enclosed in cable.

An inventory of the chemical tanks on the premises revealed that there were eight bottle type 150-lb. ammonia cylinders in the lean-to, one partly emptied and one empty ton container of chlorine inside the station, one full ton container of chlorine on the platform outside the station and two full 100-lb. cylinders of chlorine inside. All eight ammonia cylinders were ruptured and the fragments scattered widely. In all chlorine containers, the fusible plugs were found melted. Real damage, however, was relatively minor, being limited to small erosion holes, near the fusible plug openings, in the walls of the partly emptied ton container and the two 100-lb. cylinders inside the station.

Damage from the accident was primarily the disruption of water supply throughout the area. Although a few persons, including some of the volunteer firemen, were mildly gassed, none required hospitalization.

That only 41 per cent of the population of Tennessee is served by public water supplies was one of the most surprising bits of information to be found in the recently released 1945–1946 annual report of the State Dept. of Public Health. When a spot check of other data revealed that sparsely settled Montana was 54 per cent served by public supply systems and that more than 93 per cent of New York's population was so served, the Tennessee figure seemed still less credible. Much progress has been made by the water works industry, but much, too, remains to be done. Even the billion dollars of water utility construction now on paper and in process will no more than begin to fill the need for expansion in the field.

(*Continued on page 46*)

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Anderson, Irving E., Engr. in Charge, U.S. Geological Survey, Box 2052, Jackson, Miss. (July '47)

Anderson, V. E., *see* Victoria Water Dept.

Aske, H. T., Secy.-Treas., Culligan Soft Water Service, Inc., 305 W. Dayton St., Madison 3, Wis. (Apr. '47)

Atkin, H. B., *see* Citizens Utilities Co. (Greenwich)

Augustus, A. Stewart, Asst. Engr., Louisville Water Co., 435 S. 3rd St., Louisville 2, Ky. (Apr. '47)

Bagwell, C. H., Supt. of Meter Maint. & Installation, Utilities Board, 626 S. Gay St., Knoxville, Tenn. (Apr. '47)

Baker, Roger C., Geologist-in-Charge, Bureau of University Research, Univ. of Arkansas, Fayetteville, Ark. (Apr. '47)

Barnes, George W., Supt., Water Dist., Hillside Ave., S. Huntington, N.Y. (Apr. '47)

Beach, A. K., Dist. Mgr., Peoples Water Service Co. of Louisiana, Inc., Tallulah, La. (Apr. '47)

Bennett, Robert R., Dist. Geologist, U.S. Geological Survey, Johns Hopkins Univ., 103 Latrobe Hall, Baltimore 18, Md. (Apr. '47)

Bertrand, Anatole, Pres., Board of Trade, L'Orignal, Ont., Can. (Apr. '47)

Bolton, Harry M., Supt. of Public Works & City Engr., Board of Public Works, Geneva, N.Y. (Apr. '47)

(*Continued on page 30*)

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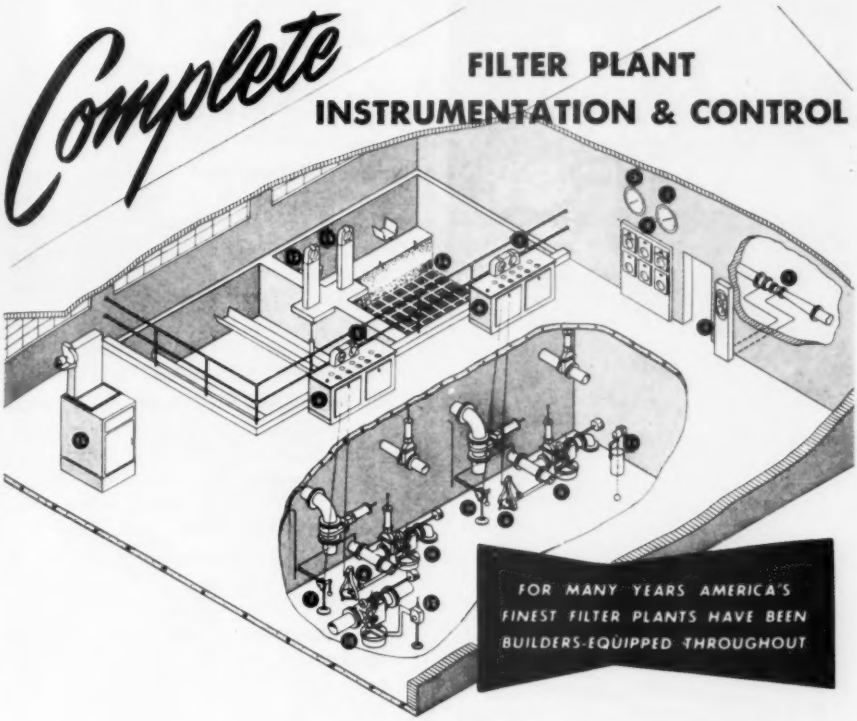

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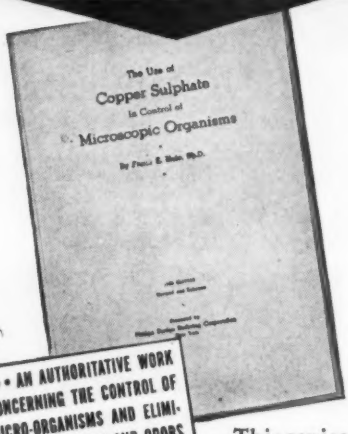

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(*Continued from page 28*)

Border, W. R., Supt. of Water & Sewers, 304 E. Koch St., Bozeman, Mont. (Apr. '47)

Boyle, W. J., *see* Thorold Public Utilities Com.

Bradlee, Warren R., Civ. & San. Engr., Smith Eng. & Construction Co., Drawer 1831, Pensacola, Fla. (Apr. '47)

Cella, J. R., Sales Quotation Section, Crane Co., 836 S. Michigan Ave., Chicago 5, Ill. (Jan. '47)

Cherry, James L., Civ. Engr. & Architect, H. A. Kuljian & Co., 1518 Walnut St., Philadelphia 2, Pa. (Apr. '47)

Citizens Utilities Co., H. B. Atkin, Vice-Pres., 125 E. Putnam Ave., Greenwich Conn. (Corp. M. Apr. '47)

Clarke, Gordon H., Franchise Repr., Orange Crush, Ltd., 100 Claremont St., Toronto 3, Ont., Can. (Apr. '47)

Conine, W. R., Resident Engr., Keis & Holroyd, Cons. Engrs., 1524 S.E. 1st St., Fort Lauderdale, Fla. (Apr. '47)

Connerton, John F., Supt. of Pumping Stations, Louisville Water Co., 3015 Grinstead Drive, Louisville 6, Ky. (Apr. '47)

Correal, Hernando, Civ. Engr., Calle 15-#9-55, Bogota, Colombia, S.A. (Apr. '47)

Cote, Gaetan J., Cons. Engr., Crepeau, Cole & LeMieus, C.P. 659, 45 Wellington, N., Sherbrooke, Que., Can. (Apr. '47)

Dalzell, William, Comr., Passaic Valley Water Com., 230 Grand St., Paterson, N.J. (Apr. '47)

Downer, John M., Sr. Bacteriologist, Board of Water Supply, Lisbon St., Honolulu, Hawaii (Apr. '47)

Draper, William L., Salesman, Mueller Co., Box 1422, Birmingham, Ala. (July '47)

Dumont, Romuald, Secy.-Treas., Waterworks Dept., Coaticook, Que., Can. (Apr. '47)

Durward, D. N., *see* Galt Public Utilities Com.

Dyer, Garvin H., Mgr., Missouri Water Co., 123 W. Kansas St., Independence, Mo. (Apr. '47)

Eyer, Chet, City Engr., Laurel, Mont. (Apr. '47)

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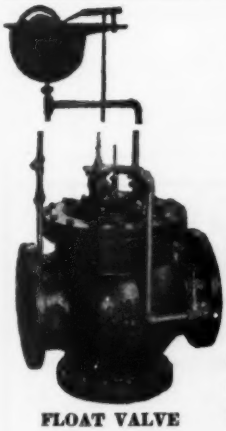

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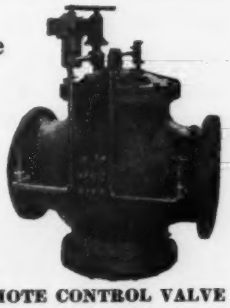

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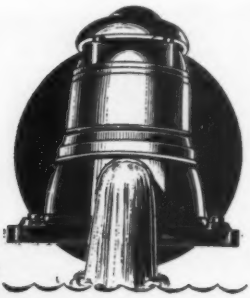

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Falk, William E., Jr., Supt. of Distr. & Production, Indiana Gas & Water Co., Inc., 4th & Culbertson Ave., New Albany, Ind. (Jan. '47)

Fishel, Vinton C., Engr. in Charge, U.S. Geological Survey, Univ. of Kansas, Lawrence, Kan. (Apr. '47)

Freeport, Inc. Village of, M. F. Van Riper, Chief Clerk, Light & Water Depts., 46 N. Ocean Ave., Freeport, N.Y. (Corp. M. Apr. '47)

Galt Public Utilities Com., D. N. Durward, Secy.-Treas., 62 Dickson St., Galt, Ont., Can. (Corp. M. Apr. '47)

Gilbert, E. Everett, Maint. Engr., Houghton College, Houghton, N.Y. (Apr. '47)

Gray, Eugene D., Supt., Water Board, 5th Ave., Attalla, Ala. (July '47)

Hall, E. W., Resident Agent Engr., Layne Central Co., Box 2222, Jackson, Miss. (Apr. '47)

Hamilton, R. L., Sales Engr., Rockwell Mfg. Co., 408a Westwood Ave., Mobile 18, Ala. (July '47)

Hayward, Harold, San. Hydr. Engr., E. T. Killam, N.Y.C., 36-33—24th St., Astoria, N.Y. (Apr. '47)

Heasley, R. G., Chemist, Water Plant, 205 S.E. 9th St., Fort Lauderdale, Fla. (Apr. '47)

Hefty, M. R., Sr. Civ. Engr., Board of Water Supply, Box 3410, Honolulu, Hawaii (Apr. '47)

Henniger, J. P., *see* Smith Falls Water Com.

Henry, Joseph R., Water Supt., Grade III, Water Supply Dist. No. 1, 19 E. Ann St., White Plains, N.Y. (Apr. '47)

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Hinds, Vern, Supt., Water Works, Clear Lake, Iowa (Apr. '47)

Hobson, Fred C., Civ. Engr., Clio, S.C. (Apr. '47)

Howell, Harold W., Field Engr., State Dept. of Conservation, 402 State Library, Indianapolis, Ind. (Apr. '47)

Jepson, A. E., Water Comr., Waterworks Dept., Box 40, Fort Erie North, Ont., Can. (Jan. '47)

Jones, Ned R., Culligan Soft Water Service, Box 149, Hannibal, Mo. (Apr. '47)

Kansas City Suburban Water Co., Inc., L. S. McArthur, Mgr., 4502 W. 59th St., Mission, Kan. (Corp. M. Apr. '47)

Keis & Holroyd, Cons. Engrs., F. J. Keis, 257 Broadway, Troy, N.Y. (Corp. M. Apr. '47)

Keis, F. J., *see* Keis & Holroyd

Kevil, Ury Jimmie, Supt., Water & Sewer Dept., City Water Works, Rule, Tex. (Jan. '47)

Latta & Fent, Ground Water Geologists, Bruce F. Latta, Box 720, Salina, Kan. (Corp. M. Apr. '47)

Latta, Bruce F., *see* Latta & Fent

Maierle, Joseph A., Vice-Pres. & Secy.-Treas., Morrison Eng. Co., Civic Center, Helena, Mont. (Apr. '47)

McArthur, Charles E., Vice-Pres., Treas. & Director, Kansas City Suburban Water Co., 828 Dwight Bldg., Kansas City, Mo. (Apr. '47)

McArthur, L. S., *see* Kansas City Suburban Water Co., Inc.

McCord, C. W., Dist. Mgr., Peoples Water Service Co. of Louisiana, Inc., Donaldsville, La. (Apr. '47)

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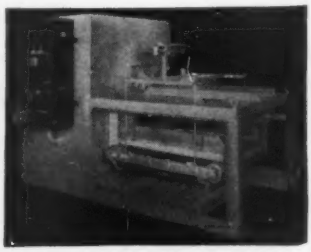

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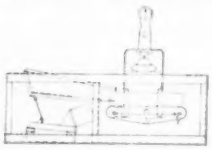

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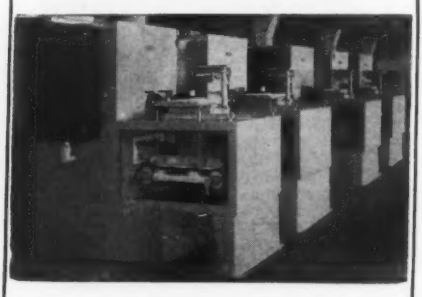

(*Continued from page 33*)

McCurdy, Howard, *see* McCurdy Sand & Water Separator Co.

McCurdy Sand & Water Separator Co., Howard McCurdy, 4875 Pacific Blvd., Vernon 11, Calif. (Assoc. M. Apr. '47)

McGee, Patrick H., Chief Water Chemist, Great Northern Ry. Co., 201 Terminal Post Office Bldg., Spokane 8, Wash. (Apr. '47)

McMahon, Neil G., Chemist, State Board of Health, Jackson, Miss. (July '47)

McMillan, M. G., Engr., Bureau of Water, Utilities Board, 626 S. Gay St., Knoxville, Tenn. (Apr. '47)

Meadows, C. A., Gen. Mgr., Meadows, Critoph & Co., 118 Richmond St., W., Toronto, Ont., Can. (Apr. '47)

Meckling, George William, Asst. City Engr., Corp. of City of Kelowna, 378 Bernard Ave., Kelowna, B.C., Can. (Apr. '47)

Morelli, Joseph, *see* New Britain Water Board

New Britain Water Board, Joseph Morelli, Chairman, 27 W. Main St., New Britain, Conn. (Corp. M. Apr. '47)

Nisbet, Thelma (Mrs.), Lab. Asst., Plant Dept. Lab., 509 S.W. 16th St., Fort Lauderdale, Fla. (Jr. M. Apr. '47)

Olson, Oscar R., *see* Terminal City Iron Works, Ltd.

Paulsen, Carl G., Chief Hydr. Engr., Water Resources Branch, U.S. Geological Survey, Washington 25, D.C. (Apr. '47)

Raasch, F. A., Supt., Water Dept., 1531 N. Lincoln St., Wahoo, Neb. (Jan. '47)

Radzow, Eric C., Chief Service Engr., Electric Chemical Co., 8001 Franklin Blvd., Cleveland 2, Ohio (Jan. '47)

Raikofski, G. Z., Water Supt., Box 464, Columbus, Mont. (Apr. '47)

Ryan, W. J., Asst. Engr., Louisville Water Co., 435 S. 3rd St., Louisville 2, Ky. (Apr. '47)

Schaefer, Eric, Chief Engr., Harold T. Smith, Contractor, Apdo. 630, Quito, Ecuador (Apr. '47)

Schubert, Max, Chemist, Water Works, Wellington, Kan. (Apr. '47)

Smith Falls Water Com., J. P. Henniger, Chairman, Smith Falls, Ont., Can. (Corp. M. Jan. '47)

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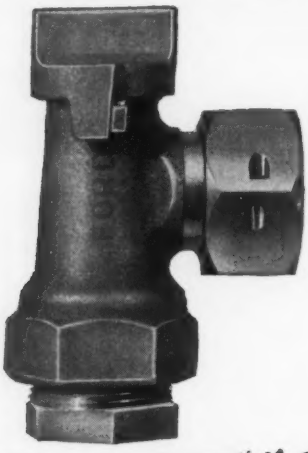

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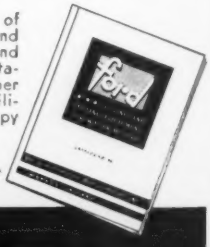

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Steel, Ernest W., Cons. Engr., Instituto Nacional de Obras Sanitarias, Reducto a Glorieta No. 90, Caracas, Venezuela (Apr. '47)

Strassburger, Gerald L., Water Operator, Butler, N.J. (Apr. '47)

Teckoe, J. E., Jr., Gen. Mgr., Public Utilities Com., 62 Dickson St., Galt, Ont., Can. (Apr. '47)

Terminal City Iron Works, Ltd., Oscar R. Olson, Gen. Mgr., 1909 Franklin St., Vancouver, B.C., Can. (Assoc. M. Apr. '47)

Thorold Public Utilities Com., W. J. Boyle, Secy.-Treas., Front St., N., Thorold, Ont., Can. (Corp. M. Apr. '47)

Tillman, Gilmore, Chief Asst. City Atty., Dept. of Water & Power, Box 3669 Terminal Annex, Los Angeles 54, Calif. (Apr. '47)

Van Riper, M. F., *see* Freeport, Inc. Village

Victoria Water Dept., V. E. Anderson, Supt., Victoria, Tex. (Corp. M. Apr. '47)

Waggoner, L. L., Mgr., Water Dept., Lake Mills, Iowa (Apr. '47)

Warner, Gordon Homer, Supt., Rose City Water Dist., 4605 N.E. 60th Ave., Portland 13, Ore. (Apr. '47)

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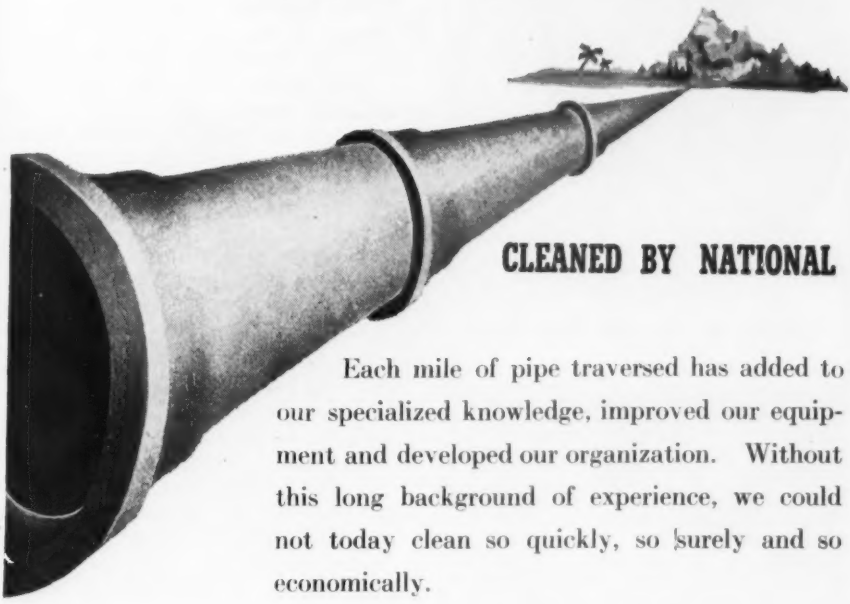

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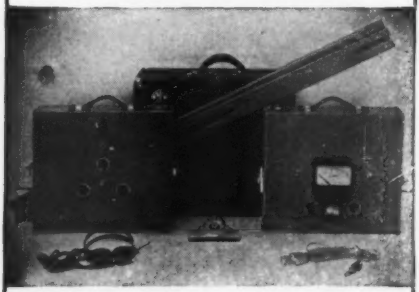

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Webb, Winchell C., Cons. Engr., 418½ E. Pearl St., Jackson, Miss. (Apr. '47)

Weir, H. McI., City Engr., City Hall, Saskatoon, Sask., Can. (Apr. '47)

Wichelman, Ed., Supt. of Meters, Water Works, Davenport, Iowa (Apr. '47)

Williams, W. L., Asst. Supt. of Purif., Louisville Water Co. Lab., Frankfort Ave., Louisville 2, Ky. (Apr. '47)

Williamson, Ben L., Chief Engr., State Board of Health, 2 Marvin Hall, Univ. of Kansas, Lawrence, Kan. (Apr. '47)

REINSTATEMENTS

Barratt, E. A., *see* North Bay, City of

Bush, Bernard S., Dist. Engr., State Dept. of Health, Kirby Health Center, Wilkes-Barre, Pa. (Apr. '44) *P*

Crabbe, Ben F., Mfrs. Repr., 607 First National Bank Bldg., Birmingham, Ala. (July '35)

Davis, Charles N., Foreman, Water Dept., 646 Hemphill Ave., N.W., Atlanta Ga., (Oct. '43) *M*

Edmonds, W. R., Supervising Engr., Dept. of National Health & Welfare, Ottawa, Ont., Can. (July '43)

Griffin, Guy E., San. Engr., 9 Upland Rd., Cambridge 40, Mass. (July '26)

Irish, J. Wilbur, Cons. Engr., 906 South St., Peekskill, N.Y. (Jan. '36)

North Bay, City of, E. A. Barratt, City Engr., North Bay, Ont., Can. (Corp. M. Jan. '37)

Peterson, Carl J., Pump & Filter Plant Foreman, Box 809, Great Falls, Mont. (Jan. '45)

Timberlake, A. G., Supt., West Virginia Service Co., Hinton, W.Va. (July '35)

LOSSES

Deaths

Bair, M. Z., MacCrea-Bair-Lefever, Engrs., 303 Gazette Bldg., Little Rock, Ark. (July '42) *AMP*

Barbour, Frank A., Hydr. & San. Engr., 1120 Tremont Bldg., Boston 8, Mass. (May '06) *Director '32–'35, '36–'37. President '36. Honorary M. '39.*

Goetz, John A., Supt., Water Dept., Mattoon, Ill. (Apr. '38) *M*

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Resignations

Challburg, W. H., Water Supt., Water Works, Wahoo, Neb. (July '46)

Hauck, G. W., Mgr. of Eng. Sales, Crane Co., 836 S. Michigan Ave., Chicago 5, Ill. (Jan. '42)

MacLean Weir, Ltd., Robert M. Weir, Mng. Director, Box 2463, North Vancouver, B.C., Can. (Assoc. M. Apr. '44)

Mayhew, H. G., Chairman, Water Com., 111 Beckwith St., Smiths Falls, Ont., Can. (Jan. '42)

Purity Springs Water Co., G. B. Warner, Gen. Mgr., Box 30, Tampa, Fla. (Corp. M. July '35)

Rumberg, Carl, Tech. Staff, Electric Chemical Co., 8001 Franklin Blvd., Cleveland, Ohio (Oct. '46)

Sellers, J. Ben, Supt., Water & Sewer Depts. Rule, Tex. (Oct. '42)

Changes in Address

Changes received between May 5 and June 5, 1947

Bennett, Richard, Hydr. Engr., 845 N. 4th Ave., Phoenix, Ariz. (Apr. '29) *M*

Brazil, Charles, City Mgr., Taylor, Tex. (Jan. '47)

Brown, L. V. Z., 1316 Orange St., McAllen, Tex. (July '38)

Capron, Edwin D., 2508 Darien St., Shreveport, La. (Jan. '47)

Chapman, Howard W., San. Engr., U.S. Public Health Service, Dist. No. 2, State Planters Bank Bldg., Richmond, Va. (July '46)

Collins, R. E., Sales Repr., Worthington-Gamon Meter Co., 808 Electric Bldg., Houston 2, Tex. (Jan. '44) *MP*

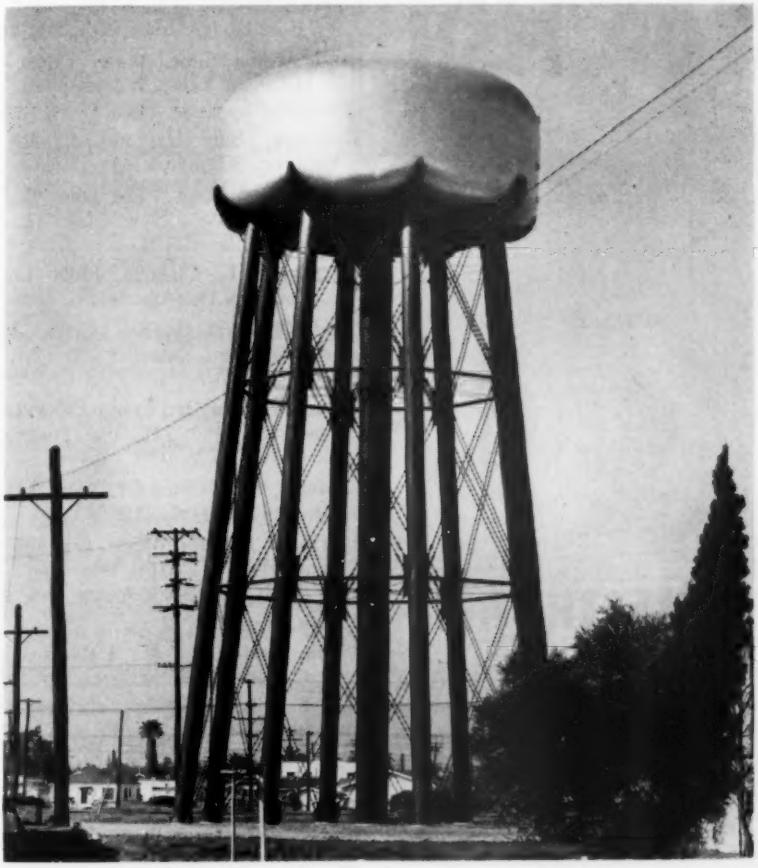
Gannon, Edward C., Western Sales Mgr., Culligan Zeolite Co., State & Cajon Roads., San Bernardino, Calif. (Apr. '47)

Hetzer, Mentor, R.D. No. 1, Moundsville, W.Va. (Nov. '16) *Director '39 '40. Fuller Award '43. M*

Kenny, Norbert J., Pres., Ohmer Corp., Box 998, Dayton 1, Ohio (Apr. '38)

Kilborn, R. Kenneth, Civ. & Mech. Engr., 67 Yonge St., Toronto, Ont., Can. (July '46)

(*Continued on page 42*)



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(*Continued from page 40*)

Larson, Harry, Lt.Col., 1407—2nd Ave., N., Fort Dodge, Iowa (Oct. '41) *P*

Lund, Armon, Supt., Water Dept., Lake & Michigan Aves., Wilmette, Ill. (Jan. '41) *MP*

McGrann, John H., 300 W. 6th St., Yankton, S.D. (Jan. '41)

Munro, Neil, Engr., The Dorr Co., 570 Lexington Ave., New York 22, N.Y. (July '44) *P*

Murphy, T. L., Chemist, 1209—13½ St., S., Fargo, N.D. (Apr. '47)

Pearl, Emanuel H., San. Engr., 2063—5th Ave., San Rafael, Calif. (Jan. '37) *MP*

Redmond, John, Jr., Capt., 250th Station Hospital, APO 225, c/o Postmaster, New York, N.Y. (Oct. '46)

Schaefer, F. A., Central Indiana Gas Co., Muncie, Ind. (July '35) *M*

Sherwood, Patricia (Miss), Box 897, Fort Lauderdale, Fla. (July '44)

Slee, Robert W., 2526 S. 2nd Ave., Arcadia, Calif. (Jan. '38) *M*

Snook, James A., Jr., California Sales Mgr., Rusta Restor Corp., 967 Russ Bldg., San Francisco, Calif. (Oct. '41) *M*

Thomas, Robert O., City Engr., City Hall, Porterville, Calif. (Oct. '46)

Van Benschoten, J., 1706 Washington Ave., Santa Monica, Calif. (June '23)

Wankmuller, Jacob T., 70-03—68th St., Brooklyn 27, N.Y. (Jan. '45) *AMP*

Weisbeck, R. J., Secy., Board of Water Comrs., Alden, N.Y. (Apr. '47)

Zadigan, Ruben, 128 Dyckman St., New York 34, N.Y. (Oct. '42)

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Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

PIPE LINES

New York's Underground Empire

Approximately two million lengths of pipe of which more than 95% is cast iron pipe, distribute water to the five boroughs of New York City—upwards of 5,000 miles of distribution mains which, if laid in a straight line, would reach from New York to San Francisco and nearly half way back again—this is New York's underground empire." These mains distribute more than 900,000,000 gallons of water per day. Some sources of supply are more than 100 miles distant.

A Billion Gallons Per Day

Chicago, from an inexhaustible supply, pumps more than a billion gallons a day through her one-and-a-half million lengths of pipe, 99.9% of which is cast iron pipe. The rated pumping capacity of Chicago's system is 1,900,000,000 gallons a day.

Fifteen Largest Cities

Here are some more typical figures giving the percentage of cast iron pipe used in the water distribution systems of the 15 largest cities in the United States, as recently reported by their Water Departments: Philadelphia, 98.3%; Detroit, 98.7%; Cleveland, 98.9%; St. Louis, 98.7%; Boston, 99.8%; Pittsburgh, 97.9%.

And In Treatment Plants

The wide acceptance of cast iron pipe is further evidenced by the fact that well over 95% of all the pipe in Water Filtration plants and Sewage Treatment plants, throughout the United States, is cast iron pipe. Under the ground, above ground, under water or set in concrete, cast iron pipe is the standard material.

Still Going Strong

Original cast iron mains have in some instances been abandoned or salvaged when it became necessary to replace them with larger-sized cast iron pipe. Nevertheless, a recent survey shows that some or all of the original cast iron water mains are still in service in 200 out of 212 of America's large cities; impressive evidence of long life and economy.

SERVES FOR CENTURIES

(*Continued from page 22*)

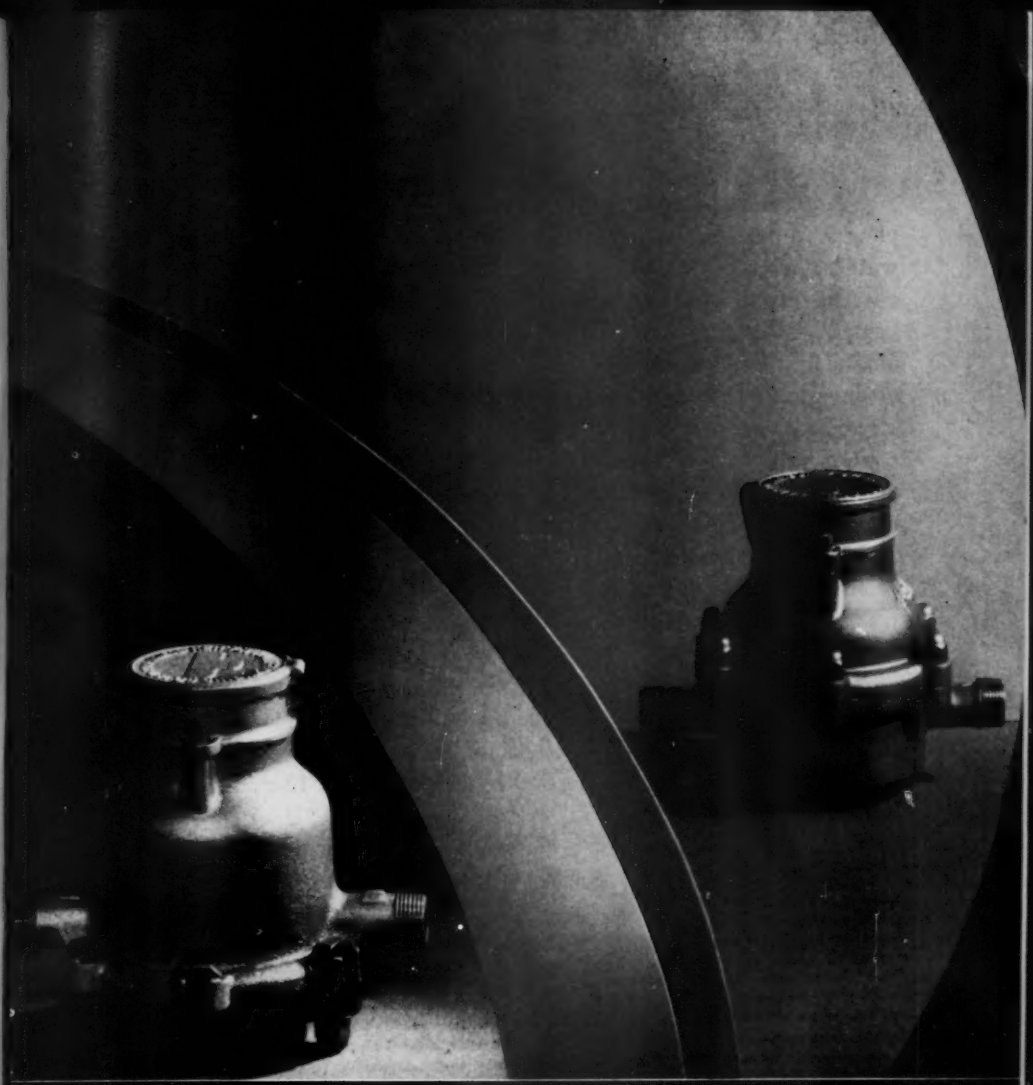
The Inter-American Association of Sanitary Engineering, established last winter as a result of the two inter-American regional sanitary engineering conferences in Rio de Janeiro and Caracas, has now issued an invitation to U.S. engineers to become charter members. Set up as a non-profit organization exclusively for scientific and professional purposes, the new association will have as its principal objective the solution of problems relating to sanitation and the establishment of standards for the uniform and continuous protection of the people of the hemisphere. In its brochure, the new society points out that membership offers an opportunity to participate in the development of a lasting understanding between the Americas through the common problem of protecting the health of their people.

Charter membership will be open until the first regular conference of the Association, scheduled for next November, possibly in Chile. Until that time, the established initiation fee of $2 has been waived. Thus membership will be made available upon the payment of annual dues of $3, which will include a subscription to the quarterly journal scheduled for early publication. Full information may be obtained from Homer J. Hayward, U.S. Representative of the Membership Committee, Inter-American Association of Sanitary Engineering, N.W. Corner 17th & Constitution Aves., Washington, D.C.

The late Lewis V. Carpenter was honored last May 13 when the unique sanitary engineering laboratory which he helped build on the campus of the New York University College of Engineering was named in his honor. As part of the dedication ceremonies, Mrs. Tempie Carpenter Van Doren, widow of the professor, unveiled a bronze plaque on the facade of the building designating it the "Lewis Van Carpenter Sanitary Engineering Research Laboratory"; Dean Thorndike Saville of the College of Engineering, who preceded Carpenter as chairman of the college's department of sanitary engineering, paid a tribute to his work; and Professor Rolf Eliassen, present chairman of the department, described recent studies at the laboratory. Present also were many New York City and technical society dignitaries.

A.W.W.A. members will remember Carpenter not only as one of the nation's leading sanitary engineers and an active worker in Association affairs, but as co-author of *The Manual of Water Quality and Treatment*, published by the Association shortly after Carpenter's untimely death in May 1940. The seven years since his death have seen many changes. His laboratory has been expanded to include an additional story and many new facilities. Many of his projects have been completed and new ones initiated. But behind the many advances which have influenced sanitation practices throughout the world can be seen the stamp of his genius both as an engineer and a teacher.

(*Continued on page 48*)



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(*Continued from page 46*)

Aqueduct patrolling by helicopter is a possibility now being explored by the Los Angeles Department of Water & Power in conjunction with an investigation of the relative merits of all types of air travel as applied to department activities. Demonstration flights which have enabled General Manager Samuel B. Morris and other department personnel to obtain first-hand knowledge of the practicality of the highly maneuverable air buggies have suggested many possible applications in water system work. In addition to their usefulness for routine patrolling, it is felt that the helicopters will perform a real service during emergencies by permitting prompt and accurate determination of the location, nature and extent of aqueduct damage. Other suggested applications involve their use in inspection of department watershed and other properties, in directing the "spreading" of surplus water during wet years, in the making of snow surveys, and in treating reservoirs with copper sulfate.

Ten million gallons of filtered water will be packaged in a single steel water storage tank now being built for the Washington Suburban Sanitary Commission by the Chicago Bridge & Iron Co. To be ready in August, the tank, which is second in size only to a 12-mil.gal. structure in India, will be 21 ft. high and 292 ft. in diameter. Its 1,205 tons of steel will be joined by welding at every seam and its interior surfaces rustproofed by a cathodic protection device. Other unique features of the mammoth reservoir will be its $\frac{1}{4}$-in. steel top and bottom, completely enclosing the structure; sides consisting of three 7-ft. rings of sheet steel, the bottom one of which will be 1 in. thick; and the 160 steel columns which will support the roof from the inside. So large is the tank that filling it without overtaxing the system will require three to four weeks.

Acquisition of this storage unit is part of a large-scale program of expansion undertaken by the commission in past months to improve service and extend the area served. Recent additions to the district have boosted its total service area to 198 square miles in comparison with the area of 95 square miles designated by the Maryland Legislature in setting up the municipal corporation in 1918. At present more than 200,000 persons residing adjacent to the District of Columbia in parts of Montgomery and Prince Georges Counties, Md., are served some 15 mgd. of Patuxent River water through the commission's two modern filtration plants.

(*Continued on page 50*)

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In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited
Montreal • Toronto • Vancouver

(*Continued from page 48*)

The Australian scientists, who recently induced an afternoon's rain by pouring dry ice into a passing cumulus cloud will undoubtedly win the immediate acclaim of water works men and farmers. The importance of the achievement goes without saying. But in offering our congratulations, we should like to reserve a good measure of applause for the man who can reverse the process on weekends.

North Carolina's Dept. of Conservation & Development recently issued a bulletin entitled "Chemical Character of Surface Waters of North Carolina, 1944–45," prepared by William L. Lamar, Dist. Chemist, U.S. Geological Survey, Raleigh. Of the 233 complete analyses included, 148 represent tests on ten-day composites of samples collected daily for a period of one year on four different streams; the other 85 cover a number of miscellaneous surface waters. Discharge measurements are reported for most streams covered, and daily temperature measurements are given for the four streams on which the detailed survey was made. Free copies of the report may be obtained from the department's Water Resources and Engineering Div., P.O. Box 2719, Raleigh.

(*Continued on page 52*)

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Cuts

- time needed to lay the line
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- labor and maintenance costs

THE addition of olefine polysulphide gives super resistance to mechanical shock and abrupt temperature changes, also reduces shrinkage in cooling • 10 lb. ingot is handy to work with, impervious to moisture and cannot change its correct composition • Full information from

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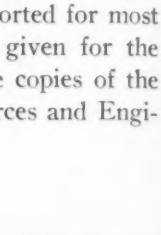

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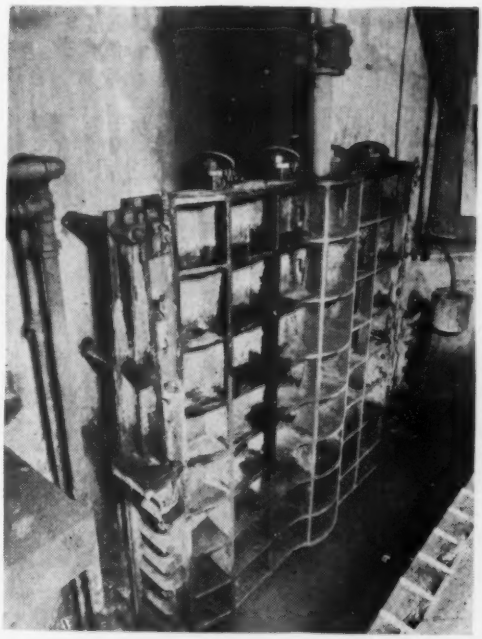
Time-tested *Everdur* Gets the call at New Jamaica Sewage Plant

THIS 8-ft. x 8-ft. main influent control and stop gate at the Jamaica Sewage Treatment Plant of the City of New York, with an unseating load of 50 tons, is restrained by 1" diameter Everdur* bolts imbedded in the concrete. The 4¼" diameter operating stem and all other bolts and mounting parts are also made of The American Brass Company's group of Copper-Silicon Alloys.



This equipment was designed and furnished by Krajewski-Pesant Mfg. Corporation, complete with the 32" diameter oil-pneumatic cylinder operating mechanism.

For the past 19 years, Everdur has demonstrated its ability to provide the exceptional corrosion resistance required to give long life under the severe conditions of sewage service. As a result, Everdur is frequently specified at those points where the most destructive conditions are encountered. For detailed information on Everdur Copper-Silicon Alloys in sewage and water works service, write for Publications E-11 and E-5.

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(*Continued from page 50*)

Timothy W. Good, Supt. of the Cambridge, Mass., Water Works for the past 29 years, retired on May 31 at the age of 75, having completed 46 years of municipal service. Beginning before the turn of the century, Good first served his city as a member of the common council from 1899 to 1900. Then he was Pres. of the Board of Aldermen in 1903; Principal Assessor from 1906 to 1910; City Treasurer from 1911 to 1913; and Mayor from 1914 to 1915. During his administration of water department affairs, which began in 1918, Good supervised the construction of the first municipally operated filtration plant in New England. His membership in the A.W.W.A. dates from 1920. First item on his agenda of post-job activities will be house-hunting, for in his position as chief of the water department he was entitled to residence in a city-owned home.

Edward Hubbard and H. Arthur Price of the Los Angeles Dept. of Water and Power each advanced a notch in the organization recently when Hubbard was appointed to the newly created position of Water System Evaluation Engr. and Price took over his old post as Specification Engr.

Hubbard, who recently completed 25 years of service with the department, had been in charge of the specifications section since its creation in 1930. Among his other duties in the new job, he will now be responsible for the investigation and co-ordination of appraisals of the various private water systems in the city, acquisition of which was authorized some months ago by action of the Board of Water and Power Comrs.

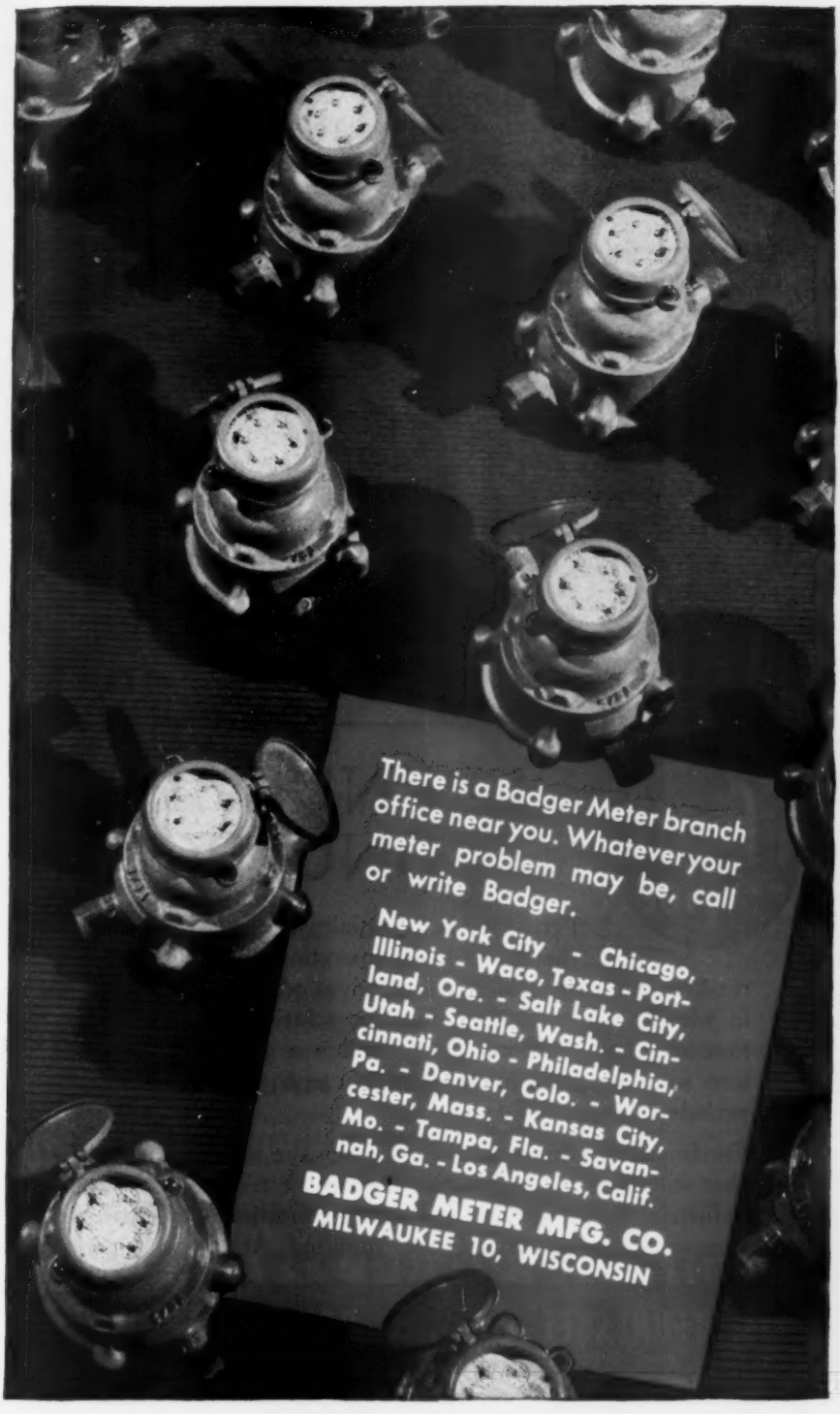
Price, who is also a 20-year man with the department, had been assistant to Hubbard since 1936. In taking over supervision of the section he will assume responsibility for the preparation of specifications for all materials, equipment and construction required by the city's water system.

Harvey F. Ludwig and Vinton W. Bacon, who worked together in conducting the field operations associated with the recent sewerage survey in Orange County, Calif., on May 1 established the firm Ludwig & Bacon, consulting sanitary engineers, in Pasadena, Calif.

Prior to the war, Ludwig was engaged on engineering projects at Berkeley, Calif., where he did considerable work with Prof. Wilfred F. Langelier at the Univ. of California. In November 1942, he entered the U.S. Public Health Service and completed assignments first with the Office of Malaria Control in War Areas at Atlanta, Ga., and later with the UNRRA in the Middle East and Jugoslavia.

Bacon has had experience with various California sewerage organizations, including the East Bay Sewage Disposal Survey and the Los Angeles County Sanitation Districts. During the war, on active duty with the U.S. Public Health Service, he operated several anti-typhus projects in the southern states.

(*Continued on page 54*)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(*Continued from page 52*)

John R. Tanner has left his work as a principal engineer with the U.S. Public Health Service in Washington, D. C., to become associated with the firm of Holmes, O'Brien & Gere, Cons. Engrs., Syracuse, N.Y., where he will be in charge of the design and construction of water supply and treatment works. In government service, Tanner previously served as Regional Engr., Water Div., War Production Board, for Regions II and IV, comprising seventeen states. Before the war he spent approximately twenty years in Florida designing, constructing and operating water utilities.

Edmund J. Ryan is now San. Engr. in charge of the Water & Sewage Sec., Headquarters, Alaskan Service Base, Fort Richardson, Anchorage, Alaska. When he joined the Army Engineers in a civilian capacity at the beginning of the war, he was assigned to Headquarters, 7th Service Command, Omaha, Neb., and later to 5th Army Headquarters in Chicago. On both assignments he was responsible for the maintenance and operation of water supply and treatment facilities for Army installations. His present activities involve the same responsibility for all Army installations in the Territory of Alaska.

(*Continued on page 56*)

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Ferri-Floc
FERRIC SULPHATE

DEPENDABLE!
ECONOMICAL!

Ferri-Floc is a partially hydrated ferric-sulfate that gives lower operating cost. Ferri-Floc is readily soluble in coldest water, gives off no corrosive fumes in warmer water, making fans on solution pot entirely unnecessary. It does not pass through a gummy stage going into solution and can be stored in open bins for indefinite periods of time.

For further information of Ferri-Floc, the superior coagulant, that will lower your operating cost in the treatment of water, industrial waste, sewage, and sludge conditioning. Write the Tennessee Corporation, Grant Building, Atlanta 1, Georgia.

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TYPE A PUMPS FOR GENERAL and PROCESS SERVICES

Capacities: 50 to 70,000 G. P. M.

PEERLESS Horizontal Centrifugal PUMPS

(Formerly Dayton-Dowd)

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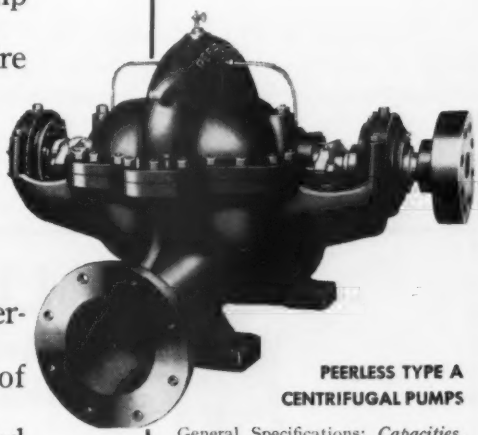
● The Peerless Type A pump is characteristic of the entire line of high quality, heavy duty horizontal centrifugal pumps, manufactured by Peerless to serve the diversified pumping demands of industry, municipalities and water works everywhere.



PEERLESS TYPE A CENTRIFUGAL PUMPS

General Specifications: *Capacities*, from 50 to 70,000 g.p.m.; *Heads*, 15 to 300 feet; *Sizes*, 2" to 42" discharge; *Drives*, electric and other types from 1 to 1000 h.p.; *Type*, single stage, double suction, split-case, ball bearing. REQUEST DESCRIPTIVE BULLETIN.

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For all your pumping requirements, plan with Peerless. Peerless' comprehensive line of pumps ncludes Underwriters' approved Fire Pumps for plant fire protection, Boiler Feed and Pipe Line pumps and scores of other vertical and horizontal types producing capacities from 10 to 220,000 g.p.m.

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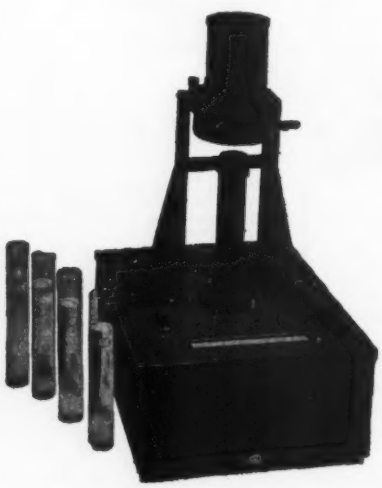
(*Continued from page 54*)

Edward S. Hopkins, Assoc. Engr., Baltimore Dept. of Public Works, was recently appointed Chairman of the American Chemical Society's Committee on Standard Methods for the Examination of Water and Sewage. In this capacity, he will work with the representatives of participating associations in preparing the next edition of *Standard Methods.*

Liquid Conditioning Corp., Linden, N.J., recently added two new water softeners to its line of water conditioning equipment—one adapted from the standard sodium zeolite method and the other from the hot lime-soda process of softening. In the design of both types, the company's engineers have attempted to overcome the various difficulties reported in the use of conventional equipment in the field. Full information on their design and adaptability for particular requirements can be obtained by addressing the company's Dept. JA, 114 E. Price St., Linden, N.J.

Northrop & Co., Inc., has moved its main sales office from New York City to the company's works at Spring Valley, N.Y. Since June 15, all company business has been transacted at the new address.

(*Continued on page 58*)



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A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

- Turbidity tests in terms of APHA (ppm) scale.
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- Suited for determination of ammonia nitrogen, nitrate, nitrite, and for all other colorimetric tests according to APHA "Standard Methods."

Operates with all "low-form" Nessler tubes 32 mm O.D., 200 mm high. Requires no matched sets of tubes.

LUMETRON Mod. 450 eliminates the uncertainties of visual matching methods. It requires no permanent color standards and furnishes reproducible results independent of individual judgment and of light conditions.

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HAYS **MEMORANDUM** HAYS

TO: *A.W.W.A. Members*

How about paying us a visit at Booth 56, A.W.W.A. Convention, San Francisco, July 21-25.

It's a good place to meet your friends, and you will want to see the new Hays "Duo-Stop"— the combination corporation stop and saddle — and the rest of the complete line of Hays Water Works Products.

We'll be looking for you.

Bert Howell — San Francisco, Calif.
Al Green — Seattle, Washington
John Adams — Los Angeles, Calif.
Pete Peterson — Southwest Territory
Les Buzzard — Erie, Pennsylvania
Jack Clemens — Erie, Pennsylvania

HAYS MANUFACTURING CO., ERIE, PA.

(*Continued from page 56*)

The Lead Industries Association, New York, recently announced the election of Robert L. Ziegfeld to the post of Acting Secretary and Treasurer. Other officers elected at the May 9 annual meeting were K. C. Brownell, Exec. Vice-Pres., American Smelting and Refining Co., to Vice-President, member of the Executive Committee and Board of Directors; and D. N. Burruss Jr., Gen. Mgr., Metals Refining Co., to the Board of Directors. All other officers and directors were re-elected.

Vacation policies and practices are always timely subjects in July, so what better time to point out two recent trends among the manufacturers in the field. A recent note from Mathieson Alkali Works, Inc., announces a new policy of basing vacation time on tenure, varying the period from two weeks to a month. Then from Neptune Meter Co. and Chicago Pump Co. have come recent word of two-week shutdowns to give their entire staffs simultaneous vacations. Though unquestionably efficient in certain types of industry, the latter practice is of course out of the question in the utility field. The former policy, however, is one that many utility men have considered good personnel policy in a field where long employee tenure pays dividends to the employer.

(*Continued on page 60*)

DIFCO

Direct Plate Counts of Coli

BACTO-BRILLIANT GREEN LACTOSE BILE AGAR

is an excellent plating medium recommended for direct counts of coliform bacteria in water. This medium conforms to the formula of Noble and Tonney as described in "Standard Methods of Water Analysis" 1936. After incubation for 18 hours at 37°C. typical colonies of coliform types are deep red and are surrounded by a pink halo.

BACTO-VIOLET RED BILE AGAR

is a recommended medium for direct plate counts of the coliform organisms in water. On plates of this medium the coliform types produce red colonies surrounded by a reddish zone of precipitated bile. Counts are made after incubation at 37°C. for 18 hours.

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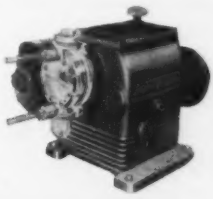
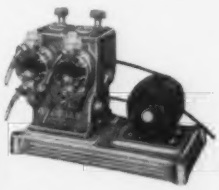


Heavy Duty Chem-O-Feeder
0-8 gal./hr. 0-100 lbs./sq. in.



Duplex Chem-O-Feeder
0-16 gal./hr. 0-100 lbs./sq. in.

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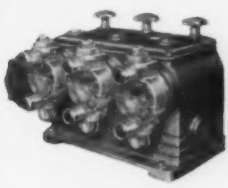
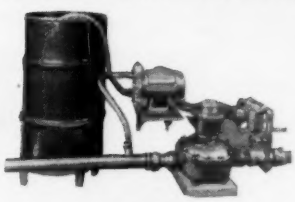
MANUALLY ADJUSTABLE AND AUTOMATIC PROPORTIONAL UNITS
DESIGNS FOR HIGH OR LOW PRESSURE

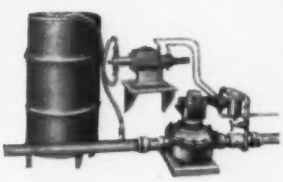


Triplex Chem-O-Feeder
0-24 gal./hr. 0-100 lbs./sq. in.

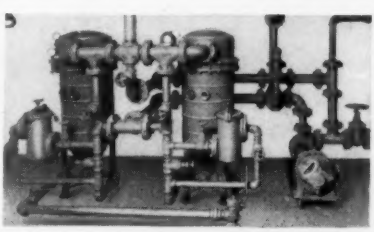
High Pressure Midget Chlor-O-Feeder
0-6 gal./hr. 30-200 lbs./sq. in.



Low Pressure Automatic and Proportional Chem-O-Feeder
0-5 gal./hr. 4-100 lbs./sq. in.



High Pressure Automatic and Proportional Chem-O-Feeder
0-5 gal./hr. 30-200 lbs./sq. in.



PUR-O-CEL DIATOMACEOUS EARTH FILTER

%Proportioneers% new Pur-O-Cel Diatomaceous Earth Filter has outstanding advantages: It utilizes thin mats of interlaced particles of diatomaceous earth instead of the conventional sand filter bed and produces unusually clean, brilliant water even at rapid flow rates. Filtering efficiency is so high that amoebic dysentery cysts and many bacteria are removed. The filter is exceptionally compact and easy to operate. With Pur-O-Cel, filtering becomes a simple, mechanical operation. Write for Bulletin 1550.

Bring us your water treating and proportioning problems

% PROPORTIONEERS, INC. %

61 CODDING STREET, PROVIDENCE 1, R. I.

(*Continued from page 58*)

CANADIAN SECTION MEETING

On April 14–16, the Canadian Section held its 27th annual meeting at Montreal, Que. Water works men from all parts of Canada attended to push registration to a total of 730, exceeded only once in the history of the section; and section membership rose to an all-time high of 409. Present, too, to address the members were three A.W.W.A. officers—President Wendell R. LaDue, Vice-President-elect Linn H. Enslow and Treasurer William W. Brush.

The technical program of the meeting consisted of eight prepared speeches and five "guided discussion" sessions. Unique in the arrangement of the program was the scheduling of three simultaneous sessions, one of which was conducted in the French language, on the first afternoon of the convention. In view of the locale of the meeting, most papers centered about a discussion of water works problems in the province of Quebec.

Opening the water purification session were two discussions on Quebec provincial procedures: "Water Purification Practice in Quebec," by Theo. J. Lafreniere, Chief Engr., Ministry of Health, Province of Quebec, Montreal; and "Laboratory Procedures and Water Standards," by M. H. McCrady and Jacques Archambault, both of the Province's Ministry of Health, Div. of Laboratories. Meanwhile, the distribution session was opened with a discussion of "Flow Metering and Controlling" by Charles G. Richardson of Builders-Providence, Inc., Providence, R.I., and a review of "Cleaning, Restoration and Preservation of Water Mains," by F. Y. Dorrance, Div. Engr., Montreal Public Works Dept.

At the French session, M. A. Gaboury, Engr. in Charge of Water Purif. for the Province, and E. A. Delisle, Chief Engr., Shawinigan Falls, Que., presented discussions of purification practices and water consumption rates in the province of Quebec.

The sessions of the second and third days were each introduced by single papers—"Economics of Water Storage," by Norman G. McDonald, Cons. Engr., Toronto, Ont. (*see* p. 637, this issue) and "Water Rate Structures in Quebec," by Alex. Lariviere, Vice-Pres., Provincial Transportation and Communication Board, Quebec.

The main features of each session were again the "guided discussions" of a series of questions distributed in advance of the meeting. The problems discussed and the discussion leaders were as follows: "Problems in Water Purification," J. H. Harrington, Montreal; "Distribution System Maintenance," W. E. MacDonald, Ottawa; "Sanitary Control and Maintenance of Service Reservoirs and Standpipes," N. J. Howard, Toronto; "Public Relations in Water Works," J. W. Churchill, Halifax; and "Economics and Maintenance Problems in Connection With Consumers' Meters," O. H. Scott, Belleville.

(*Continued on page 62*)

72 lbs. "SMALLER"

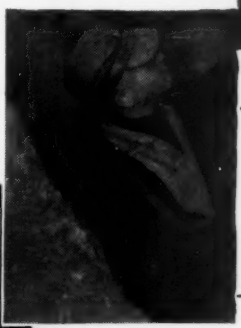
GRINNELL SOCKET FITTINGS

are easier to handle . . . cut installation time

● The 72 lb. weight advantage of this 8" Tee is typical of the space and time saving advantages of Grinnell's compact design in its complete line of socket fittings. See table for comparable sizes and weights of other popular sizes of Tees.

Socket and spigot dimensions and wall thickness are the same as AWWA Standard Class D pipe. Friction loss is not increased. Underwriters' Laboratories approved.

Write for catalog: "Water Works Specialties". Grinnell Company, Inc., Providence 1, Rhode Island. Branch Warehouses in Principal Cities.



TEE

	Grinnell		Competition	
	WEIGHT	RUN FROM BELL TO BELL	WEIGHT	RUN FROM BELL TO BELL
4"	96 lbs.	11 in.	128 lbs.	22 in.
6"	147 lbs.	13½ in.	200 lbs.	24 in.
8"	222 lbs.	16 in.	294 lbs.	26 in.
10"	325 lbs.	19 in.	395 lbs.	28 in.
12"	417 lbs.	21½ in.	512 lbs.	30 in.

GRINNELL

FOUNDED 1850

WHENEVER PIPING IS INVOLVED

(*Continued from page 60*)

Outstanding in its success was the conducted tour through the Montreal Filtration Plant, which attracted 425 of the delegates. The inspection itself was preceded by a luncheon presented by the city of Montreal.

The year's awards were presented at the annual banquet. There W. H. Waddell received his "Past Chairman's Certificate"; M. H. McCrady was advised of his selection as George Warren Fuller Awardee; Jean Blanchard was presented with the Hunt Memorial Award; Section Memorial Awards were made in memory of C. C. Folger and G. G. Routledge; Membership Service Awards were presented to twelve members; Chairman H. S. Nicklin was given a cane as a memento of office; and Treasurer and Mrs. Brush were presented with a gift in recognition of the golden anniversary of their wedding.

Entertainment during the meeting was provided through the courtesy of the Canadian Water Works Equipment Association, which sponsored a "Water Works Club Room," and a fine floor show at the conclusion of the banquet. Ladies' functions were handled under the direction of a local committee, of which Madame Des Baillets was Chairman.

Out of the discussions and meetings came a request for a study of the water rates of Canada, which will undoubtedly be acted upon by formation of a committee to investigate the situation and to recommend practices to water works administrators throughout the section.

A. E. Berry,
Secretary-Treasurer

MONTANA SECTION MEETING

The city of Havre was the scene of the 22nd annual meeting of the Montana Section, held last April 25–26. A total of 70 water works men were in attendance to join in the various technical discussions and other features of the program. Representing the parent Association in President LaDue's absence was Past-president Leonard N. Thompson of St. Paul, Minn., who addressed the convention on the subject "This Job of Ours." Guest of the section also was A. E. Griffin, Asst. Director, Tech. Service Div., Wallace & Tiernan Co., Inc., Newark, N.J., who gave a review of contemporary chlorination practices and entertained the members with a a color movie record of his visits to Rio de Janeiro and Caracas.

Opening the formal program was an address of welcome by Mayor J. A. Wright of Havre. Following the response of J. M. Schmit, City Engr. & Water Works Supt., Lewistown, were the reports of the various section officers. L. E. Anderson of the Montana Water Well Drillers Assn. then led a panel discussion of the A.W.W.A. well drilling specifications, bringing out in his opening comment the fact that the drillers welcome the use of the A.W.W.A. document in drawing up their contracts.

(*Continued on page 64*)

It's Strong, Light and Easy to Install

• ARMCO Spiral Welded Steel Pipe has many advantages in water-main service. It is amply strong without excess weight. Long 50-foot lengths mean easier installation—fewer joints, less assembly work.

Its spun enamel lining prevents tuberculation, makes for highest possible flow capacity. Tight joints are assured with any standard type coupling or by field welding.

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ARMCO

ARMCO STEEL PIPE

MEETS A. W. W. A. SPECIFICATIONS

(*Continued from page 62*)

H. S. Thane, Hamilton, assisted by F. F. Palmer, Forsyth, and Roy N. Arnold, Whitefish, presented a panel on "Public Relations," reviewing the work of the Association's program and discussing additional methods of obtaining consumer good will. Closing the first day's technical program was a review of the Montana school for water and sewage works operators by H. B. Foote, Director, Div. of San. Eng., State Board of Health. Describing the history of the school, Foote announced plans to increase the course from two days to a week and to give the lectures at Montana State College, using the college faculty as instructors. In resuming the program on this increased scale, it is expected that it will be possible to give a more thorough course, presenting diplomas to those in attendance, and to gain more support from the state's municipalities.

Opening the second session, Arthur Johnson, Supt., Kalispell Water Dept., presented a discussion of "Municipal Water Works Organization in Montana," in which he reviewed the laws under which water works organizations in the state operate, financing methods and local and state control of supplies. Following this presentation, John Hazen, Butte, led a panel discussion on the "1946 Drinking Water Standards." Introducing the subject, he discussed the advantages of the standards to the operator in giving him a definite goal toward which to work in improving his system. Contributing to the discussion also were C. W. Eyer, Glendive, Steward Voden, Great Falls, and C. T. Carnahan of the U.S. Public Health Service at Denver, Colo. In his discussion Carnahan outlined the procedure of the U.S.P.H.S. in certifying supplies used on interstate carriers and pointed out that the judgment required in applying the standards was usually left to the decision of the state health departments.

Final item on the program was a round table discussion of a number of water works problems led by S. R. Young of Hardin. Among the subjects discussed from the floor during this session were: impounding reservoirs; the use of radio by water works; retirement programs for public employees; lime-soda softening techniques; and filter plant equipment.

All delegates were guests of the city of Chinook, some 22 miles away, on the afternoon of the first day of the meeting. There they were conducted on an inspection trip through the Utah-Idaho sugar refinery and the Chinook Filtration Plant, following which the city gave a banquet in their honor.

Closing the meeting was the annual dinner-dance held at the Havre Elks Club, with Dr. Vande Bogart, Pres., Northern Montana Normal College as toastmater. Featured at the dinner was an address by Russell Vognild of Tacoma, Wash., in which were described his experiences in Persia, under the title of "Ali Baba and the Forty Stenches."

C. W. Brinck,
Secretary-Treasurer

(*Continued on page 66*)

You are cordially invited to visit the
Calgon booth, No. 30, at the A.W.W.A.
Convention, San Francisco, July 20-25, 1947
*See for yourself how Calgon**
prevents scale . . . controls corrosion . .
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(*Continued from page 64*)

ALABAMA-MISSISSIPPI SECTION ORGANIZATION MEETING

At the Thomas Jefferson Hotel, Birmingham, Ala., on May 23–24, 87 A.W.W.A. members and guests from Alabama and Mississippi, formerly affiliated with the Southeastern Section, met to organize the 28th local section of the Association. Under the direction of A. Clinton Decker, Chairman of the Organization Committee, members discussed, amended and adopted by-laws and elected their officers, and then went on to conduct their first technical sessions.

Following the address of welcome by Pres. Cooper Green of the Birmingham City Commission, A.W.W.A. Secretary Harry E. Jordan presented a discussion of the aims, policies and functions of the parent Association, in which he hailed the organization of the Alabama-Mississippi Section as another step in the growth and expansion of the organization.

W. H. H. Putnam, Asst. Mgr., Birmingham Water Works, presented the first technical paper, outlining the expansion of the Birmingham filtration plant from a 6-mgd. to a 12-mgd. unit. H. A. Kroeze, Director, Div. of San. Eng., Mississippi State Board of Health, then reviewed "Public Water Supplies in Mississippi," presenting facts and opinions regarding sources, conservation measures, chemical quality, supervision, management and plans for future water works improvement and expansion in the state.

Final paper of the first session was an illustrated talk on "Steel Tanks for Water Works," presented by H. F. Stearns, Dist. Sales Mgr., Atlanta, Ga., office of Chicago Bridge & Iron Co. Stearns discussed the evolution of the steel water storage tank from the unattractive stovepipe of the "Nineties" to present-day models, citing the various factors which have influenced the changes in design.

In addition to further section business, the second session included two addresses: "Water, Wells and Men," by Axel O. Fabrin, Designing Engr., Layne & Bowler, Inc., Memphis, Tenn.; and "Cast-Iron Pipe," illustrated by a sound motion picture, by Tom M. Starnes, Southern Sales Mgr., American Cast Iron Pipe Co., Birmingham. Both addresses were good general reviews of progress and plans in their particular fields.

Featured at the meeting banquet was an address by A.W.W.A. President Wendell R. LaDue and a presentation, by W. H. Weaver, Chairman of the Southeastern Section, of a share of the Southeastern Section funds to the new group. J. B. Converse, Pres. of J. B. Converse & Co., Engineers, Mobile, Ala., who presided at the banquet, also read numerous telegrams and letters of congratulations from members and other sections of the Association.

ARTHUR N. BECK,
Secy., Organization Com.

NEWS OF THE FIELD

Mid-August seems the proper time to depart from customary forms of comment and to consider briefly that form of metropolitan nuisance known as the researcher—*the researcher via telephone.* One wonders whether Alexander Graham Bell would have called Watson if he had realized how many persons in a large city would grow into the habit of grabbing the telephone and demanding from the busy person at the other end of the line instant attention and answer to any question which the inquirer's job requires him to obtain. Believe it or not, within ten minutes on a busy morning just before the San Francisco Conference, two researchers (neither one a member of A.W.W.A.) posed these questions: How many cesspools in the United States? How many gallons of water go over Niagara Falls in an hour? Probably no sensible person would not grant that answers to such questions should never be demanded of a busy person by telephone. By writing a letter, one can give the man who has a job of his own to do, time to think.

No! We do not know how many cesspools there are in the United States. Yes! We do know how many gallons of water are supposed to go over Niagara Falls in an hour. Do you?

Opera in Greenville is the uncomfortable record of the recent South Carolina lynch trial told in the beautiful prose of British authoress Rebecca West, writing as "Reporter at Large" for *The New Yorker* magazine of June 14. Not water, but blood, is the theme that makes her story as moving and humanly significant as that publication's recent tale of "Hiroshima." It cannot be our purpose here to pass judgment on Miss West's proposition or performance; that must remain an individual conviction. But attention should be called to the opening passage of her story, which sets its scene and tone:

> The note of Greenville, South Carolina, is rhetorical. Among the stores and offices on Main Street there is a vacant lot that suddenly pretends to be a mountain glade, with a stream purling over a neatly assembled rockfall; and in the foreground there is staked a plaque bearing the words "Greenville City Water Works, 1939. The water supply of Greenville, South Carolina, pure, sparkling, life's most vital element, flows by gravity from an uncontaminated mountain watershed of nine thousand acres, delivered through duplicated pipelines, fourteen million gallons capacity, a perfect water for domestic and industrial uses." Not in such exuberant terms would the existence of a town water supply be celebrated in the North or in my native England, and no deduction can be drawn from this that is damaging to the South. The exuberance is actually a sober allusion to reality. Here one remembers that water is a vital element. . . .

(Continued on page 2)

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Our national standards of measurement are all fouled up. The inch and pound units applied to us at birth have never been legalized; the metric system of weights and measures has. Yet the meter and millimeter legalized by Congress were defined in terms of an "inch" that had never been fixed. And to top it off, when we finally obtained a standard meter bar and reversed the definitions, we ended up with an unlegal inch that was approximately four-millionths longer than the British inch.

All this difficulty began some 150 years ago, when the Constitution delegated to Congress the power to fix standards of measurement and found that body interested but ineffectual. It was not until 1836 that the Senate did something about it, directing the Secretary of Treasury to supply the governors of the various states with a set of all weights and measures used by his department in the collection of customs. Although some of the states adopted these units as standard, Congress took no action until 30 years later, and then it merely added to the confusion by recognizing the metric rather than the commonly used English system and basing its definition on the unfixed inch.

Now, at long last, on the initiative of the Navy Department, acting through the Department of Commerce, a bill has been presented to Congress to legalize both systems of measurement and to establish the generally recognized conversion ratios. And, in preparing the bill for Congressional action, the Director of the Bureau of the Budget is sounding out American industry on the desirability of the legislation. In co-operation with the effort, the American Standards Association is also bringing the matter to the attention of its membership, soliciting an expression of its viewpoint on the matter for presentation as evidence.

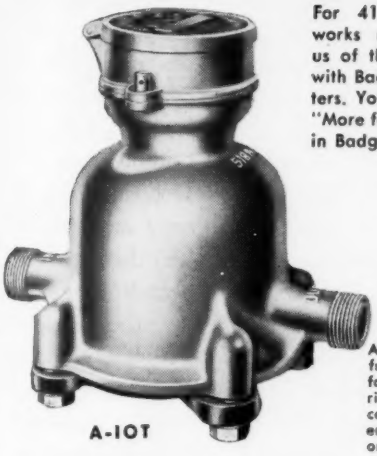
Both science and industry look forward to a final resolution of the matter, but no more than do the unborn infants of America who have long resisted measurement in terms of kilograms and meters.

Flatbush found something new to cheer last June 30, when New York City's Catskill water supply was transfused into its system. To celebrate the end of a 66-year struggle with a brackish, odoriferous well water, so hard that it practically chipped their glassware, the natives joined Mayor O'Dwyer and numerous other civic officials in toasting their "emanicipation day" with a water that could actually be called a "soft drink." And at the end of a long siege of petitions, promises and litigation, apparently everybody was happy.

Although the rates for the new supply will be approximately 50 per cent above those previously charged, both landlords and householders look forward to the end of their long struggle against rampant corrosion. Housewives gleefully dug out huge bundles of laundry reserved for the

(*Continued on page 4*)

Let Badger Meters **SAVE** *for you!*



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For 41 years waterworks men have told us of their satisfaction with Badger Water Meters. You, too, can get "More for your money", in Badger Meters.

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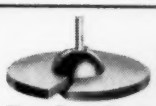
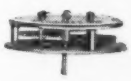
Above, left, Model A-IOT, frost proof meter, designed for cold climates. Above right, Model SC-IOT, (split case), designed for warmer climates. Oil enclosed or open type gear trains are optional.

Two Piece Measuring Chamber—Snap joint construction; no screws; all bronze. Smooth internal surface eliminates excessive wear and maintains accuracy. An actual comparison will convince you.



Three Piece Disc — The disc is of the flat three piece design. Component parts are made of the best grade of vulcanized rubber. Extreme care is taken to see that all parts are concentric with each other.



Circular Reading Registers—All parts of non-ferrous materials, heavily plated to guard against corrosion. All bearings are rubber bushed. Dials have heavy copper base; black letters on white porcelain for ease in reading.

Straight Reading Registers — Non-ferrous materials; heavily plated. Indestructible brass number wheels are not affected by heat. Dials are of the same high quality as used on all regular Badger circular reading registers.

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(*Continued from page 2*)

"coming of suds." Flatbushites bathed, cooked, drank—and marvelled almost as if "Dem Bums" had won the pennant. Even the New York Water Service Co., which formerly served the area and which is now involved in litigation regarding the property valuation, joined in the spirit of the day by announcing that the original site of its business would become the location of a $50,000,000 housing development for 5,000 families.

Only serious note of the entire proceedings was the warning issued by Commissioner Cannella of the Dept. of Water Supply, Gas & Electricity who announced that the additional 28-mgd. supply to be served to 400,000 Flatbush consumers would overtax the city's available supply by approximately 22 mgd. Pointing out that the war-delayed Delaware water system, scheduled for completion in 1945, would not be ready until 1950, he indicated that steps were being taken to attack the problem through the institution of an all-out leak hunt which would involve inspection of every one of the city's 25,000,000 spigots in an effort to reduce the present 180-mgd. estimated leakage. Summarizing the situation, Tobias Hochlerner, chief department engineer, also revealed that the 2 per cent overdrain on the city's 1,100-mgd. supply was being met by a temporary diversion of water from Rondout Creek at Lackawack, N.Y., to conserve the 250-day supply now stored in the system's reservoirs.

Property owners of Chanute, Kan., have the city-owned utilities to thank for their freedom from property taxes since 1930. Holding their rates to the average of other localities in the area, the water, gas and electric utilities of the city have for the past seventeen years paid all costs of municipal government in addition to paying off the municipal debt, making Chanute debt-free as well as tax-free as of the beginning of this year. The 309 residents of Moro, Ore., too have been freed of their property taxes this year, but for a different reason. The city has been unable to purchase materials for needed improvements.

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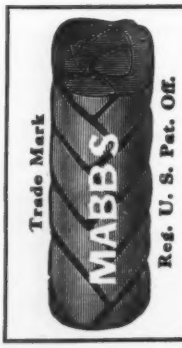

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Tough trenching or soil conditions are no obstacle in laying a "Century" line.

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WHY ENGINEERS ARE SWITCHING TO K&M *"Century"* ASBESTOS-CEMENT PIPE

When an engineer constructs a new water supply line—or replaces an old one—with "Century" Asbestos-Cement Pipe, he secures these inherent advantages:

1. Easy, speedy, economical installation. "Century's" light weight, long 13′ lengths, and easy-to-use flexible couplings are sure-fire savers of time and money.

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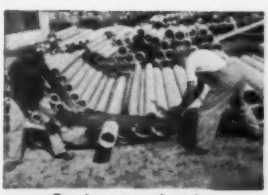
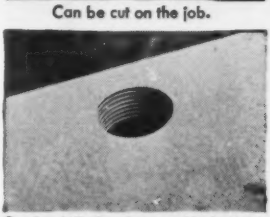
3. A maintenance-free line. "Century" Asbestos-Cement Pipe is immune to corrosion, tuberculation and electrolysis. It withstands vibration and shock.

4. 100% salvage value. It is easily removed and may be re-installed at its original working pressure.

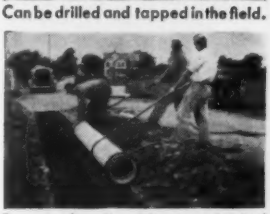
For engineers all over the country, these features are proof enough of "Century" Asbestos-Cement Pipe's superiority. You'll find it ideal for your own requirements. Why not write us for further details?



Can be cut on the job.



Can be drilled and tapped in the field.



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(*Continued from page 4*)

Breckenridge, Minn., paid a dividend "in kind" to its population of 2,745 recently by providing a month's free water, light, power and heat to all consumers. The municipal water and light commission reported that the savings to the community amounted to approximately $10,000.

In Brooklyn, in May, for the second time in as many months, overfreedom of expression was rudely arrested. This time no lip was buttoned, but a man with a sandwich sign was hailed into court on a charge of disorderly conduct for advising the public in large block letters of his low opinion of the Brooklyn Edison Co. Although decision regarding the details of the gagging were deferred to a later hearing, reporters found that the source of the difficulty was a meter, which the defendant had allegedly tampered with some ten years previous. Involved in litigation on that matter for many years, the truculent consumer found he could no longer restrain himself and proceeded to picket the home of the company's investigator and inspector bearing a huge sign proclaiming: "Edison—Gangsters, Crooks, Thieves, Liers (*sic*), Extortionists, Murderers." Brooklyn's water supply is not metered.

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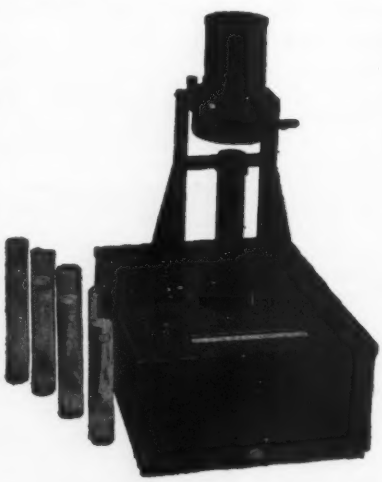

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A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

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Other types and sizes of famous LUDLOW Water Works Valves now obtainable on normal deliveries, with RAPID DELIVERY on Hydrants.

V-72

The LUDLOW VALVE
SINCE 1866
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(*Continued from page 6*)

Visitors to Chicago's new South District Filtration Plant will undoubtedly have their agenda for observation planned in advance. All that has been said and published concerning the huge undertaking has whetted many a water works man's appetite for investigation, as it had A.W.W.A. Secretary Harry Jordan's last April 10 when he was conducted through the plant by City Engr. W. W. DeBerard and Engr. of Water Purification John R. Baylis. But if for no other reason than a yen for consternation, everyone who has the opportunity should make the pilgrimage to see in person "The Waves," who decorate the approach to the building. Hewn from stone in the image of a hamburger with a cramp, this *objet d'art,* which has received a variety of nicknames coarser than the top layer of sand in Baylis's filters, is a challenge to the imagination of the most matter-of-fact engineer. Not to deprive anyone of the opportunity for contemplation, we reproduce herewith an early portrait. Enlightening comment or interpretive discourse will be appropriately welcomed.

THE WAVES WITH ADMIRERS JORDAN, BAYLIS AND DEBERARD

E. P. Sellner, formerly Assoc. San. Engr., Kansas State Board of Health and Asst. Prof. of San. Eng., Univ. of Kansas, has accepted a position as Assoc. Prof. of San. Eng. at the Univ. of Oklahoma, where he will also assist in the university's new program of instruction leading to a bachelor of science degree in sanitation and public health.

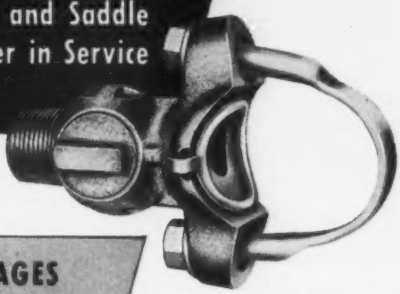
Attractive formats for utility reports appear to be gaining impetus. Recent steps in that direction have been taken in Midland, Mich., to sell general obligation storm sewer bonds and in Lynwood, Calif., and Lincoln, Neb., to present city financial reports. All cities are leaning heavily upon illustrations and unusual techniques of reporting or art work to "destodgify" their presentations.

(*Continued on page 10*)

It's New . . .

HAYS "DUO-STOP"

A Combination Corporation Stop and Saddle
That's Simpler to Apply, Stronger in Service



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NINE IMPORTANT ADVANTAGES of the New HAYS "DUO-STOP" and Pipe Saddle

- The new Hays "Duo-Stop" makes possible a quick, simple, and safe installation of corporation stops on small mains of 2" size, where the small diameter and the thin wall make it impractical to tap the main.
- The "Duo-Stop" is strapped securely and permanently to the main, the stop is opened, and the hole is drilled, by a drilling machine inserting the drill through the stop.
- The installation may be made while the main is under water pressure - - Thus no shutdown of service.
- There is no threaded connection in the Pipe Saddle Shut-Off; stop and service clamp are one piece, solid rust-proof bronze, pressure tight and leakless.
- The extra strength, secured by one-piece construction and reinforced ribbed design, prevents distortion due to strain of strapping, or of outside stresses, and assures perfect functioning.
- The lead gasket provides a tolerance that guarantees a tight fit on either cast iron or steel service mains.
- The 2" "Duo-Stop" Saddle is designed for use on either 2" cast iron or steel pipe. The 2¼" "Duo-Stop" Saddle is designed for use on either 2¼" cast iron or 2½" steel pipe.
- The fact that service clamp and stop are cast in one piece simplifies purchasing and stock-keeping. Eliminates necessity of purchasing as separate items.
- Outlets for all types of services.

Write for Folder 105

HAYS
COPPER BRASS LEAD IRON
WATER WORKS PRODUCTS
HAYS MANUFACTURING CO., ERIE, PA.

(*Continued from page 8*)

From Tokyo, Lt. Col. Jack J. Hinman Jr., still serving as Chief of Utilities with 8th Army Headquarters, has forwarded his regrets that he was unable to attend the San Francisco Conference. Still busy keeping the occupied territory supplied with water, reducing leakage in the Tokyo distribution system, squelching rumors of a water shortage and attending to his numerous duties as utilities chief, Hinman deplores the fact that he has not had time or opportunity to keep up to date on what's happening back home. Even now he's planning an intensive tour of A.W.W.A. section meetings and plants upon his return; and from his reports of activities in photography and observation it appears that he will be able to teach as much as he learns on his tour.

WANTED—a bacteriologist! A newly organized research project in the Eastern U.S., being supervised by an A.W.W.A. member, is in quest of a man with a bacteriology degree and some background in chemistry and in the field of water and sewage research or treatment. Depending upon qualifications, the salary offered ranges from $3,200 to $4,200 per annum. If you're interested, send your application, with a summary of your qualifications, to the JOURNAL—Att: Mng. Editor, referring to Item 847.

(*Continued on page 12*)

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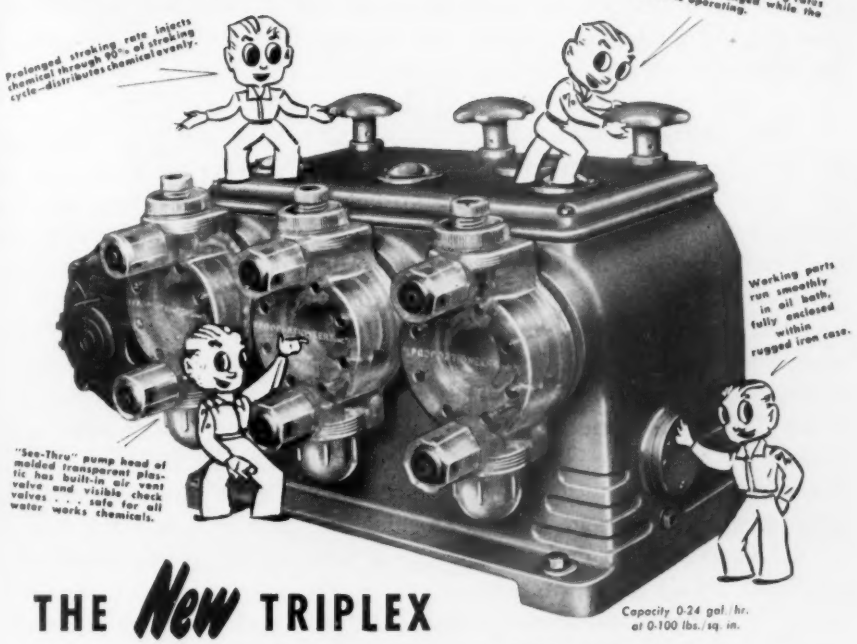
By a turn of the knobs, the feeding rates may be selected and changed while the Chem-O-Feeder is operating.
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Capacity 0-24 gal./hr. at 0-100 lbs./sq. in.

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%Proportioneers% Triplex Chem-O-Feeder is compact (24" x 16" x 12" overall) and new in design . . . it feeds three different chemicals, each at a predetermined, adjustable rate. This single unit injects exactly the right amount of hypochlorite, alum, and soda ash, or any other water treating chemicals, for sterilization, coagulation, pH control, etc. Simple to operate, accurate and long-lived, the Triplex provides . . . in one package . . . *complete* economical water treatment for the new or modernized plant.

Write for complete information.

% PROPORTIONEERS, INC. %

61 CODDING ST., PROVIDENCE 1, R. I.

(*Continued from page 10*)

At Santa Rosa, Calif., last May, voters who had three times rejected bond issues and charter amendments to modernize the city's water system suddenly reversed themselves and by an eight to one decision approved a $440,000 bond issue and amended the charter. The money obtained from sale of the bonds is to be used to purchase the privately owned McDonald water works, to connect it to the municipal system and to finance improvements to the consolidated system. The charter amendment abolishes a provision requiring the city to furnish a "reasonable amount of water" free to residents and authorizes the establishment of a rate structure that will make the utility self-supporting. Work on consolidation of the systems was undertaken immediately and a new rate structure established, providing for a minimum charge of $1 per month for 7,000 gal., as against the old one which allowed 5,000 gal. free to residential users.

Hair shirts are fast fading. Once hats were *de rigueur* throughout the year, fair weather or foul; now even New Yorkers are beginning to bare their hair (or heads) to the sun, unostracized. Now, too, has the male gained momentum—though only vocal perhaps—toward achieving the open collar and the unlapeled jacket in the heat of summer. Who knows but someday he'll be permitted enough comfort to become efficient.

But a newer and yet more impressive indication of the "New Functionalism" is the current trend toward realism in writing—of all things—business letters. With the formation of the Society for the Elimination of the "Dear" in Business Letters, and the appearance of such articles as "Write as You Talk—Customers Like It" in a recent issue of *Edison Electric Bulletin,* we begin to realize just how far "gone" is society already. Secure in the knowledge that we are not the "first by whom the new is tried," we must admit that we, too, have at least one foot on the bandwagon and have ceased longer to address the Amalgamated Cesspool Septitank Corp. in terms of endearment. As a matter of fact we never really did care that much for "Cessie."

With every letter written and every unhorrified reply received, we gain courage to continue, until now even a ten-page booklet on "Correspondence Courtesy," in which James Gray, Inc., New York printing firm, recently gave us the last word on addressing properly all manner of persons from "Abbotts" to "Women, Married," has not dismayed us.

(*Continued on page 14*)

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Well Strainers, 2 to 40 in.
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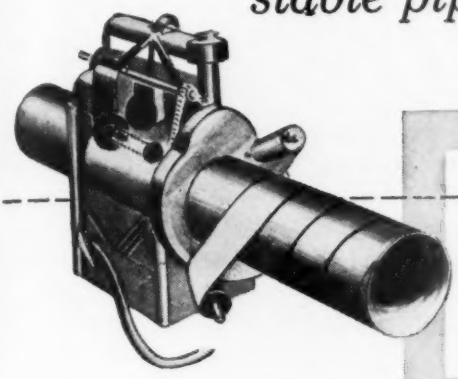
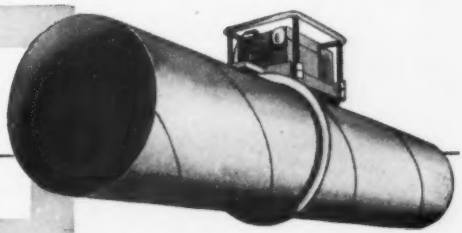
The economics of cathodic protection require the use of stable pipe protection



plus modern methods of application

and electrical inspection



Barrett Coal-tar Enamels, because of their low-moisture absorption under varying conditions of the soils, provide a constant, uniform and long-lasting stable underground insulation.

Mechanically applied by modern methods, these coal-tar enamels assure the proper continuity of the insulation.

Electrical inspection improves the quality of application and the handling of pipe during construction and, together with a pipe protection of stable dielectric strength, makes cathodic protection economical. This combination permits the use of a minimum number of cathodic protection units, spaced the maximum distance, and a minimum investment in the complementary electrical protection. A dependable procedure when designing corrosion-proof pipelines.

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Barrett COAL-TAR ENAMEL

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(*Continued from page 12*)

The New York State Sanitary Code was amended recently by the addition of a section establishing qualifications for public health engineers, santitarians and sanitary inspectors. Authorized by the last session of the State Legislature, the action was taken because of the increased demand for professional workers in the field of environmental sanitation, occasioned by the current drive to expand state health services. The new qualifications will provide a means of implementing recruitment of new personnel for local health departments by civil service authorities.

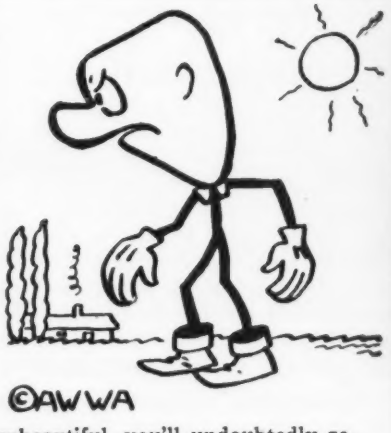
The Honolulu suburban water system recently completed a million dollar project at Kahaluu to provide additional water to residents on the windward side of Oahu, T.H. Through a tunnel 6 × 7 ft. in bore and 460 ft. long into the Koolau Mountains and 5 miles of 16-in. pipe, about 2½ mgd., representing a 50 per cent increase, is being brought into the service area from Kahaluu Spring. The project is the first large development undertaken by the utility since before the war.

Keith R. Chinn, formerly Plant Supt. of the West Palm Beach (Fla.) Water Co., is now serving as City Manager of West Palm Beach.

(*Continued on page 16*)

Introducing

THE DRIP



Samson had his Delilah; Caesar had his Brutus; Charlie McCarthy has his Mortimer Snerd; and now a thorn has appeared in Willing Water's bed of roses. Snarling and grumping his way through every water works, the Drip hasn't been caught red-handed yet, but we have good reason to believe that he's the wreaker of unending havoc. Observing him now, beetle-browed and unbeautiful, you'll undoubtedly remember seeing him whizzing by aboard his flying disk or hearing his cackling sneer at the scene of a broken main or a clogged filter.

Watch for him and help give him the notoriety he deserves. Then call on Willing Water for the cure. Typical examples of his gremlinesque activities will soon be available in the form of newspaper mats and electrotypes from:

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have never been surpassed for capacity and accurate registration for all rates of flow. Self-contained bronze case up to six inches.

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BRANCH OFFICES: NEW YORK — PORTLAND, ORE. — PHILADELPHIA — ATLANTA — DALLAS — CHICAGO
SAN FRANCISCO — LOS ANGELES

(*Continued from page 14*)

An important book now available is the National Bureau of Standards' *Supplement to National Directory of Commodity Specifications* issued Mar. 1, 1947, to bring up to date the complete directory published June 30, 1945. Included in the new publication are a listing and brief description of all new and revised standards and specifications formulated by all nationally known and recognized trade associations, technical societies and governmental agencies since the 1945 edition went to press. Used in conjunction, the two books provide a complete compilation of current nationally recognized specifications, classified and cross-indexed for ready reference.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., at a price of $2.25, the book may be obtained by requesting "Supplement to Miscellaneous Publication M178."

The National Bureau of Standards has announced industry approval of Simplified Practice Recommendation R185–42, Pipe Fittings. To be renumbered R185–47, the revised recommendation will become effective September 1, superseding the original standard which served as a basis for mandatory orders issued by the WPB during the war.

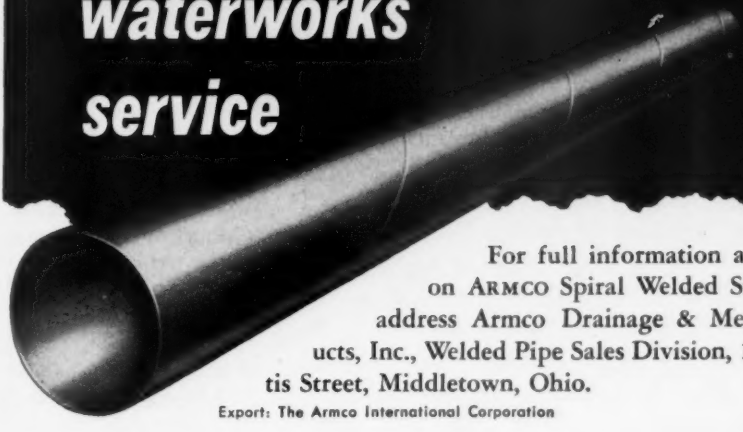
The revision, which applies to gray cast-iron, malleable iron and brass or bronze fittings, represents an increase in the number of fittings over the original simplified list, but includes substantially fewer items than formerly included. As finally adjusted, the recommendation covers a comprehensive group of fittings required for sprinkler systems in addition to regular lines for other purposes and, in the section on brass or bronze items, provides for sectional as well as general needs.

Printed copies of the revised recommendation will be available on or about Sept. 1, before which time mimeographed copies may be obtained from the Div. of Simplified Practice, National Bureau of Standards, Washington 25, D.C.

(*Continued on page 18*)

THIS STEEL WATER PIPE does not crack under pressure*

...nor from shock, soil shifts or temperature changes in normal waterworks service



For full information and prices on ARMCO Spiral Welded Steel Pipe, address Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1495 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation

*Ultimate strength, 50,000-60,000 psi.; yield strength, 30,000-40,000 psi.; elongation in 2 inches, 30%.

ARMCO

ARMCO STEEL PIPE

(*Continued from page 16*)

Tennessee state, county and city employees, except day laborers, are now eligible for retirement benefits under a new system established by authority of a recent bill approved by the legislature. Requirements for city and county participation are to be fixed by a state retirement board soon to be organized. Participation, now voluntary, will become mandatory for state employees on July 1, 1949. Employee contributions are to be matched on a 50–50 basis by the state.

Another waste products nuisance was cleared up recently when the U.S. Dept. of Agriculture's Div. of Dairy Laboratories announced the successful alcohol fermentation of the lactose in whey. With the development of a commercial process to produce ethyl alcohol from this present waste product—the average alcohol yield of which is 84 per cent—another difficult pollution problem will be solved. Solved also, if to our further disillusionment, is the nursery-born problem of Miss Muffet's manifest interest in the stuff.

The Three-Generation Club enrolled its fourth member recently when Charles H. Lord, Water Supt. & City Engr. of Ogdensburg, N.Y., submitted his qualifications. Beginning with *Grandfather* Alexander H. Lord in 1868, the Ogdensburg Water Dept. has had a Lord at the reins continuously. Upon the death of Grandfather Lord in 1893, *Father* Harry A. Lord took over the position, holding it until his death in 1918. Then *Son* Charles stepped into his shoes and has held the position ever since, adding to that responsibility the position of City Engr. in 1926.

The Alabama Water and Sewage Works Assn. completed its formal organization at its second annual conference and short course held last June at the Univ. of Alabama. Adopting a constitution and by-laws, the members elected the following officers: President—W. H. H. Putnam, Asst. Mgr., Birmingham Water Works Co.; Vice-Pres.—Tom Collins, Mgr., Ozark Water Works; Secretary—Alex O. Taylor, Director, Eng. Extension, Alabama Polytech. Inst.; Treasurer—Gilbert H. Dunstan, Assoc. Prof. of San. Eng., Univ. of Alabama; and Editor—Charles White, Engr., State Board of Health, Montgomery.

Prior to the opening of the conference, Prof. Dunstan supervised a three-day short course in basic water system chemistry. Then for three additional days, the more than 100 representatives of Alabama, Mississippi and Florida water and sewage works who attended discussed mutual problems and new techniques. Featured speakers were Arthur N. Beck, Chief Engr. & Director, Alabama Dept. of Public Health, Dr. D. G. Gill, State Health Officer, and W. H. Nicol, City Comr. in charge of Tuscaloosa's water works.

(*Continued on page 20*)

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WATCH DOG WATER METERS

SURE TO MEET YOUR SPECIFICATIONS FOR ACCURACY, LOW MAINTENANCE, LONG LIFE

Before you invest in water meters, get acquainted with the design and performance advantages which make Worthington-Gamon Watch Dog Water Meters first choice of so many municipalities and private water companies in the United States.

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(*Continued from page 18*)

George W. Biggs Jr. and F. R. Berry, respectively Vice-President and Chief Engineer of Water Works Service Co., Inc., New York, had completed a joint total of 95 years of service with the company when they retired together last June 30. Having joined the American Water Works & Electric Co. organization within a year of each other—Berry in 1899, Biggs in 1900—the two "B's" have helped the organization grow from 30 plants to 69 and from 2,000 miles of mains to more than 8,000, and have grown with it. Both have had an active part in developing and improving the company's service in engineering capacities.

Berry began his career with the company as a timekeeper on construction jobs in the Midwest. In 1903–1905, he served as resident engineer at Birmingham, Ala., and then went west to work on the company's irrigation projects for two years. His construction assignments kept him busy until 1914 when he was appointed to the Home Office Operating Dept., which had just been moved from Pittsburgh to New York. He served in that capacity until 1925 when he was appointed Chief Engr. of the subsidiary American Water Works Construction Co., later becoming Asst. Chief Engr. for water works properties of the parent

(*Continued on page 22*)

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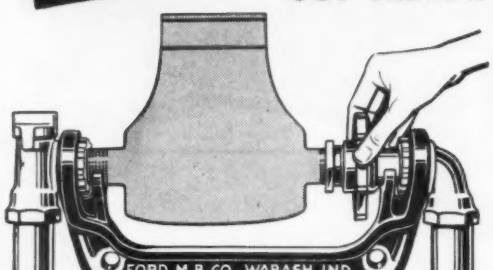
CUT METER CHANGING TIME!



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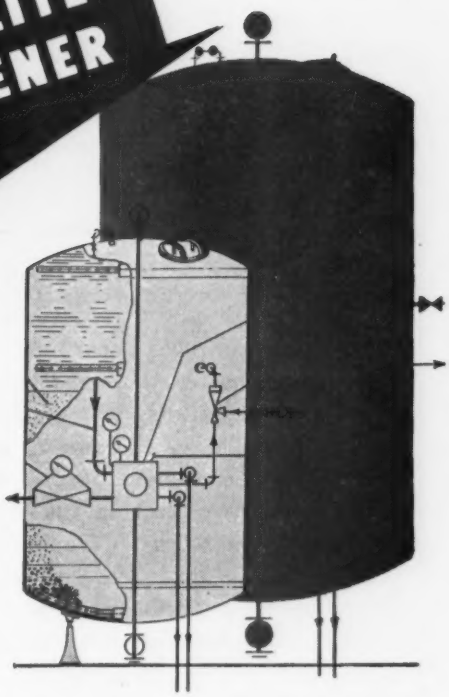

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EVERY PROCESS . . . EVERY TYPE OF EQUIPMENT

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(*Continued from page 20*)

organization. Finally, in 1944, he took over the position he held at retirement.

Biggs began his work with the company in its drafting department three years after graduation from the Univ. of Pittsburgh. In six years he had worked up to the position of Chief Engr., which he held continuously until his appointment as Vice-President and Director of the service company and Director of the parent organization.

Both men are members of the A.W.W.A., Biggs since June 1916, Berry since April 1923, and both have been active not only in the development of their own organization's water works activities but of the field as a whole.

John A. Goetz, 1886-1947

The death of John A. Goetz, Superintendent of the Mattoon, Ill., Water & Sewer Department, on April 26, ended the career of one of the most capable and progressive water works men in the state. Under his leadership the Mattoon water system was converted from a backward and confused endeavor, formed by the imperfect fusion of a private "clear" water system and a public industrial (raw surface water) system, into a well co-ordinated and efficient utility.

Goetz was born at Waukesha, Wis., 61 years ago. Although his formal education was limited, he supplemented that work with correspondence school study of engineering and over the years acquired a wide knowledge in his field. As a young man he worked on construction and engineering projects in the Milwaukee area, moving later to Arcola, Ill., where he established a general contracting business. In 1914 he established residence in Mattoon, continuing his contracting and material business until 1933, with time out for a few years between 1920 and 1930 to serve as City Engineer. From 1933 to 1935, he served as superintendent of the city-owned industrial water system; and, after another break, became superintendent of both systems in November 1937 after the city had purchased the private company plant in 1936. Finally, in July 1941, he was also appointed superintendent of the Sewer Department.

A member of the Association since 1938, Goetz has been particularly active in Illinois Section affairs, serving as an officer of that unit several times. A member of a number of state technical societies, he also made an important contribution to Illinois' water works progress by serving on the committee which outlined legislation to govern qualifications of water works operators.

(*Continued on page 44*)

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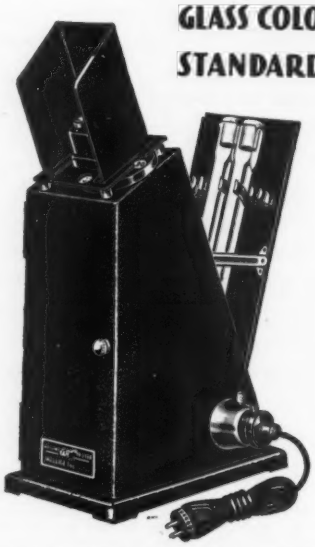

THE HELLIGE AQUA TESTER combines the advantages of non-fading glass color standards with radical improvements in design. This Water Tester is, we believe, the most advanced type ever brought on the market and brings to its user the utmost in accuracy, permanent reliability, and ease of operation.

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Write for Bulletin No. 602

HELLIGE
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CHANGES IN MEMBERSHIP

NEW MEMBERS

Applications received June 1 to 30, 1947

Ackerman, Theodore V., Engr., Water Dept., 319 City Hall, Pasadena 1, Calif. (July '47)

Allison, S. L., Supt., Sewer Dept., Route 1, Box 1, Corpus Christi, Tex. (July '47)

Anderson, George, Supt. of Utilities, Hill City, Kan. (July '47)

Anderson, L. E., Water Well Drilling, 828 Broadwater Ave., Billings, Mont. (Apr. '47)

Auld, Edward P., Sr. Mech. Engr., Board of Water Supply, Box 3410, Honolulu, Hawaii (Apr. '47)

Balles, S. E., *see* Plainview Water Dept.

Barksdale, Henry Compton, Dist. Engr., Ground Water, U.S. Geological Survey, 714 Trenton Trust Bldg., Trenton 8, N.J. (July '47)

Beatty, Melvin, Supt., Water Dept., 641 Notre Dame, Grosse Pointe, Mich. (July '47)

Bell, Bennie C., Gen. Foreman, Alaska Dept., U.S. Army, APO 980, Unit 2, % Postmaster, Seattle, Wash. (July '47)

Borchardt, Jack A., Instructor in Civ. Eng., Hydr. & Sanitary Lab., Univ. of Wisconsin, Madison, Wis. (Apr. '47)

Bradley, John C., Mgr., Charlotte Branch, General Chemical Co., Box 970, Charlotte, N.C. (July '47)

(*Continued on page 30*)

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1. Compact cast iron measuring section —ready to place in the line.
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4. No straight section of pipe on exact grade required upstream of flume casting.
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7. Small head loss—requires very little free fall at outlet.
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9. Ability to measure over long flow range—from maximum to 5% of maximum.
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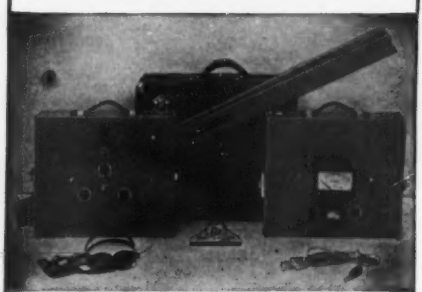

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(*Continued from page 28*)

Briggs, John W., Asst. Supt., Water Dept., 230 W. Stephenson St., Freeport, Ill. (July '47)

Bryan, Harry D., Sales Engr., Ludlow Valve Mfg. Co., 1636 Oliver Bldg., Pittsburgh 22, Pa. (July '47)

Catey, Ed. F., Asst. Utilities Engr., Hydr. Div., California Public Utilities Com., 368 City Hall, San Francisco, Calif. (July '47)

Challenger Mfg. Co., Charles D. Hirst, Gen. Mgr., 41 Wilson Ave., San Jose, Calif. (Assoc. M. July '47)

Charles, Paul L., Sales Engr., Walsh & Charles, Ltd., 206 Tribune Bldg., Winnipeg, Man., Can. (July '47)

Crawford, L. K., Cons. Engr., Crawford, Murphy & Tilly, 400½ E. Adams St., Springfield, Ill. (July '47)

Crow, William B., Asst. Supt., Water & Light Plant, 1909 N.W. 6th St., Gainesville, Fla. (July '47)

Dougherty, Burton W., Dist. Mgr., Pittsburgh Pipe Cleaner Co., 601 Mercantile Library Bldg., Cincinnati 2, Ohio (Apr. '47)

Fulmer, Frank E., Designing Engr., Clyde E. Williams & Assoc., 312 S. Colfax Ave., South Bend 7, Ind. (Apr. '47)

Goedhart, Robert C., Chemist in Charge, Boiler Feed, U.S.S.C., Box 385, Clewiston, Fla. (July '47)

Gordon, M. O., Operator, City Water Plant, 119 S.E. 5th Court, Fort Lauderdale, Fla. (July '47)

Haas, Eugene G., Resident Cons. Engr., Morris Knowles, Inc., 3904 Vaux St., Philadelphia 29, Pa. (Apr. '47)

Haller, Charles H., Sr., Supt., Water Works, Box 45, Port Orange, Fla. (July '47)

Heckert, William A., Sales Engr., Herr-Harris Co., 545 William Penn Pl., Pittsburgh 19, Pa. (July '47)

Hines, Hugh, Distr. Foreman, Water Dept., 918 E. 13th St., Lawrence, Kan. (Apr. '47)

Hird, Harold H., Chief Operator, Filtration Plant, Water Dept., 1142 Connecticut St., Lawrence, Kan. (Apr. '47)

Hirst, Charles D., *see* Challenger Mfg. Co.

Ibach, J. R., *see* St. Lawrence River Power Co.

(*Continued on page 32*)

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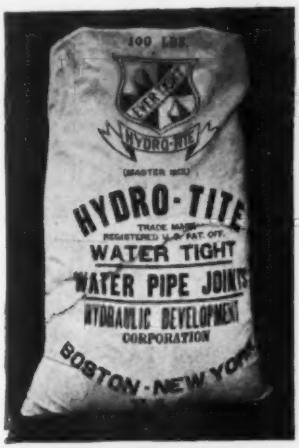

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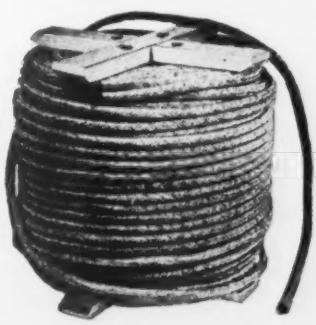

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(*Continued from page 30*)

Jolly, Russell L., Sales Engr., Mueller Co., 205 W. Wacker Drive, Chicago, Ill. (July '47)

Jones, Malcolm S., Jr., Asst. Utilities Supt., Public Works Dept., Puget Sound Naval Shipyard, Bremerton, Wash. (Apr. '47)

Jones, R. M., Director of Research, Liquid Carbonic Co., 3100 S. Kedzie Ave., Chicago 23, Ill. (July '47)

Kleinbach, Howard W., Structural Eng. Asst., Dept. of Water & Power, Box 3669 Terminal Annex, Los Angeles 54, Calif. (July '47)

Lieberman, J. A., Civ. Engr., Div. of Water Resources Management, Southeastern Forest Experiment Station, Box 252, Asheville, N.C. (Apr. '47)

Livingston, Vern, Mgr., Public Utilities, Sidney, Neb. (Jan. '47)

McKenzie, Norman, City Clerk & Water Supt., City Hall, Wakeeney, Kan. (July '47)

McLean, Walter R., Sr. Civ. Engr., East Bay Municipal Utility Dist., 512—16th St., Oakland 4, Calif. (July '47)

McLendon, Samuel Chaney, Engr., Long Island Water Corp., 3337 Merrick Rd., Lynbrook, N.Y. (July '47)

Miller, John A., Supt., Water Dept., Canfield, Ohio (July '47)

Miller, Lawson I., Jr. San. Engr., Div. of Water Purification, 3842 Prairie Ave., Chicago, Ill. (July '47)

Muth, Verner R., Assoc. Utilities Engr., California Public Utilities Com., 536 State Bldg., Civic Center, San Francisco, Calif. (July '47)

Myers, Bert E., Vice-Pres. & Supt., Rhinebeck Water Co., Rhinebeck, N.Y. (July '47)

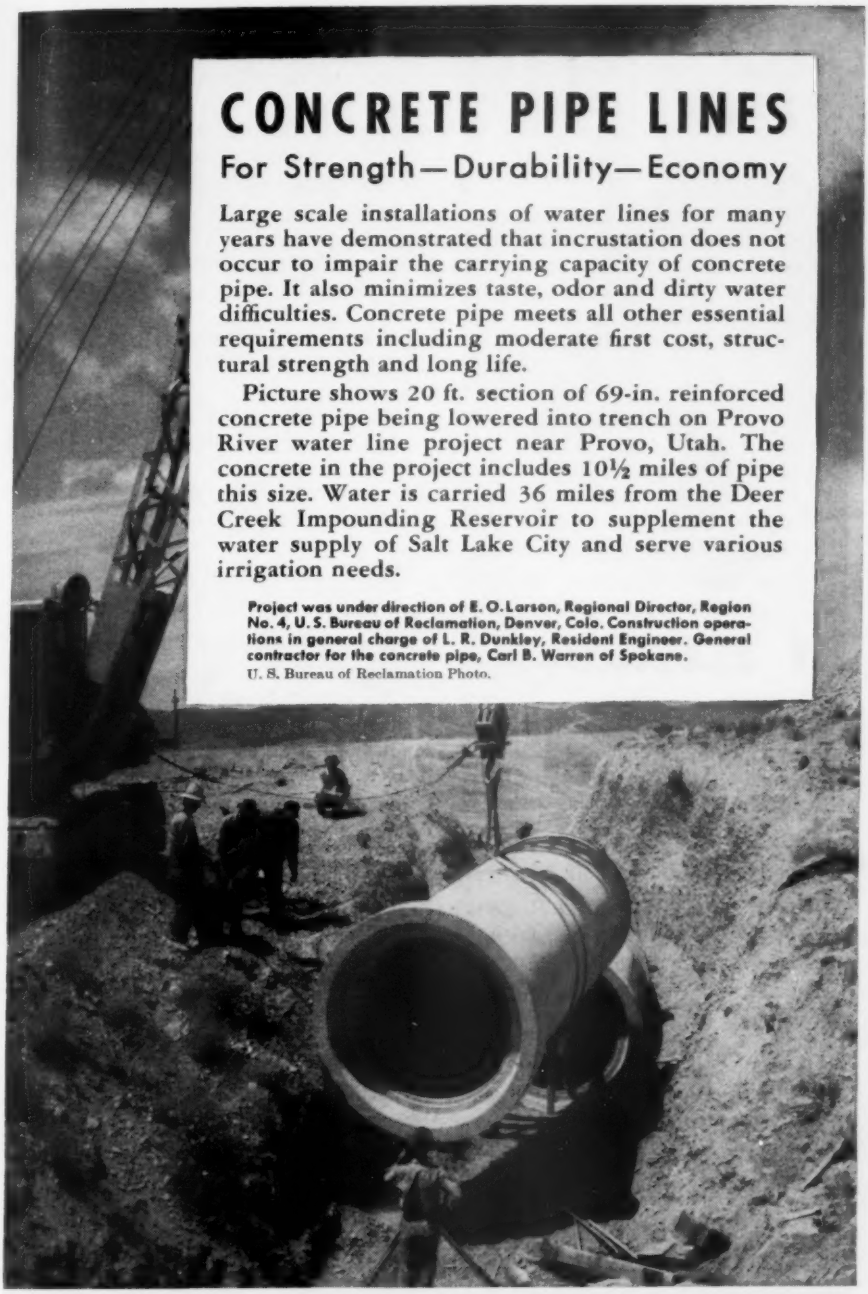
Myers, James W., Jr., Mgr., Philadelphia Suburban Water Co., 762 Lancaster Ave., Bryn Mawr, Pa. (Apr. '47) (*Transfer from Corp. M. status*)

Norris. Clyde F., Asst. Utilities Engr., California Public Utilities Com., 536 State Bldg., Civic Center, San Francisco, Calif. (July '47)

Pennell, Edgar F., Supt. of Water, 229 N. Spring St., Loudonville, Ohio (July '47)

Peterson, H. A., Clerk, The Columbia Malting Co., 141 W. Jackson Blvd., Chicago, Ill. (July '47)

(*Continued on page 34*)



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(*Continued from page 32*)

Plainview Water Dept., S. E. Balles, Supt., Plainview, Tex. (Corp. M. July '47)

Potter, Charles M., Water Supt., 815 S. Main St., Yreka, Calif. (Apr. '47)

R.P.B. Corp., B. A. Schimmel, Vice-Pres., 1517 Santa Fe Ave., Los Angeles 21, Calif. (Assoc. M. Apr. '47)

Reed, George W., City Engr. & Water Supt., 435 Bridge St., Yuba City, Calif. (July '47)

Roark, Chris C., Foreman, Neches Butane Products Co., Port Neches, Tex. (Apr. '47)

Robinson, Joe L., Dist. San. Engr., State Dept. of Health, Box 1495, Lubbock, Tex. (July '47)

St. Lawrence River Power Co., J. R. Ibach, Elec. Supt., Massena, N.Y. (Corp. M. July '47)

Schaefer, Edward J., Hydr. Engr., U.S. Geological Survey, 553 E. Broad St., Columbus 15, Ohio (July '47)

Schimmel, B. A., *see* R.P.B. Corp.

Schneller, M. P., Sales, Aurora Pump Co., 629 Loucks St., Aurora, Ill. (July '47)

Shope, Harlan Duncan, Civ. Engr., International Paper Co., Box 594, Panama City, Fla. (July '47)

Simmonds, John G., Plant Supervisor, West Palm Beach Water Co., Box 1311, West Palm Beach, Fla. (Jan. '47)

Smith, Raymond C., Installation Supervisor, Omega Machine Co., 1636 N. Merrimac Ave., Chicago, Ill. (July '47)

Smith, Warren, Supt., Water Works Utility, Washburn, Wis. (Apr. '47)

(*Continued on page 36*)

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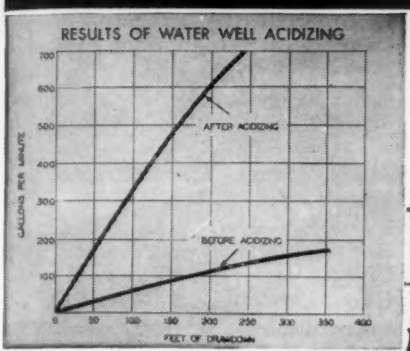
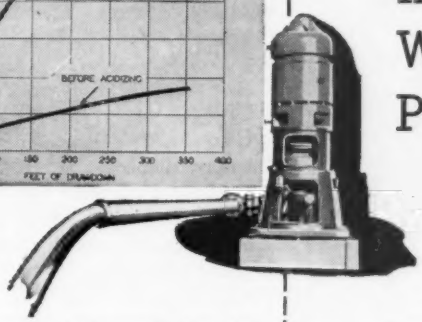


Drawdown Curves showing the advantages to be obtained from proper chemical treating of water wells.

Increase Water Well Production!



Treatment results, in Dowell files, list the many production increases which have been secured through the proper chemical treatment of water wells. The enlargement of formation pores and the removal of retarding incrustations on screens, tubing and pump equipment permit the production of more water—faster!

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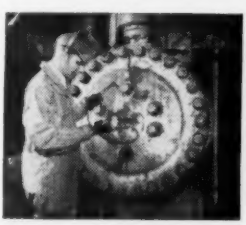

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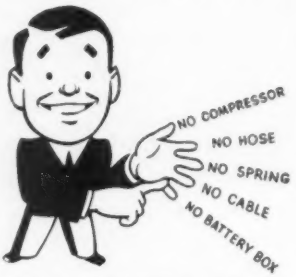

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(*Continued from page 34*)

Stansmore, Keith Carnegie, Graduate Engr., The Dorr Co., 80 Richmond St., W., Toronto, Ont., Can. (July '47)

Trice, Milton R., Supt., El Paso County Water Control & Improvement Dist. No. 1, Box B, Ysleta, Tex. (July '47)

Tufts, William, Water Comr., Water Dist., Sudbury, Mass. (July '47)

Vernezobre, Santiago Prieto, Sub-Director, Acueducto de Albear-Havana-Cuba, Calle "C," No. 6 e/1ra. & 3ra., Vedado, Havana, Cuba (July '47)

Wheelin, James L, Sales Dept., Neptune Meter Co., 50 W. 50th St., New York 20, N.Y. (July '47)

Williams, Johnie E., 1505—4th St., Brownwood, Tex. (Apr. '47)

Wilson, Robert T., Repr., *Water & Sewage Works*, Gillette Publishing Co., 22 W. Maple St., Chicago 10, Ill. (July '47)

Woolley, Ralph R., Sr. Hydr. Engr., U.S. Geological Survey, 303 Federal Bldg., Salt Lake City, Utah (July '47)

Zink, Ray E., Sales Engr., Builders-Providence, Inc., 122 S. Michigan Ave., Chicago 3, Ill. (July '47)

REINSTATEMENTS

Adams, Walter F., City Engr., Santa Rosa, Calif. (Oct. '39)

Fuller, A. Kenneth, Dist. Mgr., California Water & Telephone Co., 971 Orange Ave., Coronado, Calif. (July '38)

Grossman, Frank, Sales Repr., Glamorgan Pipe & Foundry Co., 122 S. Michigan Ave., Chicago 3, Ill. (Mar. '34)

(*Continued on page 38*)

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KV-106

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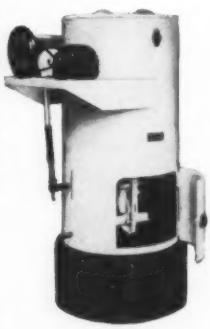

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(*Continued from page 36*)

LOSSES

Deaths

Goff, William A., Cons. Engr., Broad St. Station Bldg., Philadelphia 3, Pa. (July '37) *M P*

Lea, William S., Cons. Engr., 1226 University St., Montreal 2, Que., Can. (Jan. '24) *P*

Resignations

Classon, W. Guy, 1157 Main St., Leominster, Mass. (June '31)

Jacques, Henry L., 762 S. Brand Blvd., San Fernando, Calif. (Sept. '31)

Jones, Carl C., Sidney, Neb. (July '35) *M*

Reynolds, R. W., Supt., West Palm Beach Water Co., Box 1311, West Palm Beach, Fla. (Nov. '26) *Fuller Award '41. Director '40–'42. A M P*

Changes in Address

Changes received between May 5 and July 5, 1947

Aschenbrenner, Paul F., San. Engr., 325 E. Congress St., Rantoul, Ill. (July '46)

Baumann, Edward Robert, Research Assoc. in San. Eng., 701 W. Ohio, Urbana, Ill. (Jan. '47)

Bock, A. W., 112 Baurline St., Fort Worth 11, Tex. (Oct. '39)

Brown, W. V., Mgr., Public Utilities Com., Seaforth, Ont., Can. (July '44) *M*

Bruah, Howard R., Jr., 1502 E. 75th Pl., Chicago 49, Ill. (Jan. '47)

Burt, Gordon L., Capt., San Engr., 4141 Ottawa Ave., Riverside, Calif. (Jan. '47)

Bushnell, Charles, 65 Ford Ave., Wharton, N.J. (Apr. '37)

Coblentz, Maurice H., Sr. San. Engr. (R), Office of International Health Relations, Federal Security Agency Bldg., 4th & Independence Ave., S.W., Washington, D.C. (Aug. '29) *P*

Doggett, Felix G., San. Engr., Mount Airy, N.C. (Oct. '41) *P*

Ebright, H. L., Dist. Mgr., Robert W. Hunt Co., 3050 E. Slauson Ave., Huntington Park, Calif. (July '41) *M P*

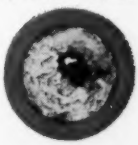
Fooks, Jack H., San Engr., 32 Ridge Rd., Linwood, Pa. (Jan. '47)

(*Continued on page 40*)

TUBERCULATION

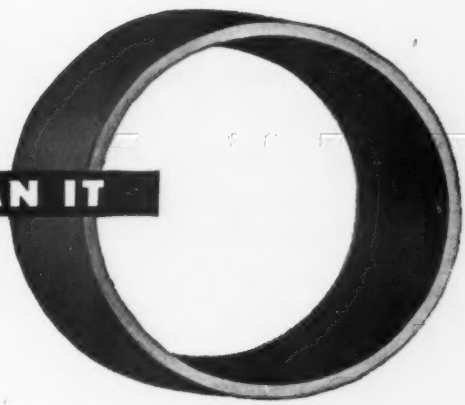
SEDIMENTATION

INCRUSTATION



IF IT'S *CLOGGED*

WE CAN CLEAN IT



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LOS ANGELES.....448 South Hill Street
MEMPHIS.....822 Dermon Building
OMAHA.....3812 Castellar Street
RICHMOND.....210 East Franklin Street
ST. LOUIS.....7103 Dale Avenue
SALT LAKE CITY....149-151 W. Second South Street
SAN FRANCISCO.....681 Market Street
MONTREAL.....2028 Union Avenue
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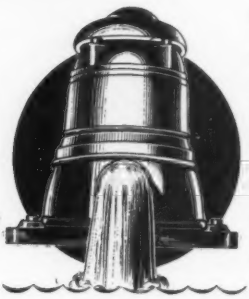
WATER



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LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

(*Continued from page 38*)

Geupel, Louis A., 531 S. Rotherwood Ave., Evansville 14, Ind. (Nov. '22) *MP*

Gullans, Oscar, Filtration Engr., South District Filtration Plant, 3300 E. Cheltenham Place, Chicago 49, Ill. (May '33) *P*

Hoyt, Richard M., Salesman, Solvay Sales Corp., 1216 Edgewood Ave., Jacksonville 5, Fla. (Oct. '46)

Jeffords, Russell M., Geologist, Dept. of Geology, Univ. of Texas, Austin, Tex. (Jan. '47)

Kircher, A. M., 417 Van Brunt, Mankato, Minn. (Oct. '39) *AMP*

Kozma, Albert B., San. Engr., c/o William C. Olsen, Cons. Engr., 406 Raleigh Bldg. & Lona Bldg., Raleigh, N.C. (Affil. Jan. '44) *P*

McGrann, John H., Box 4374, Fronden Station, Jackson, Miss. (Jan. '41)

McKean, Hugh C., Chemist, Water Treatment Plant, State Hospital, Box 56, Mt. Pleasant, Iowa (Oct. '46)

Northrop & Co., Inc., Guy Northrop, Spring Valley, N.Y. (Assoc. M. Oct. '45)

Oeffler, W. A., Mgr., Sunny Isles Water Co., Box 36, North Miami Beach, Fla. (Jan. '37) *AMP*

Ogden, Willis L., c/o W. R. Ogden, Box 432, Annawan, Ill. (Nov. '43) *P*

Purdom, Paul W., San. Engr., 31 Barclay St., Knoxville, Tenn. (Jan. '44) *P*

Ruehl, Edward H., 207 Builders' Exchange Bldg., Richmond 19, Va. (July '35) *MP*

Sellner, E. P., Assoc. Prof. of San. Eng., Univ. of Oklahoma, Norman, Okla. (Oct. '45) *P*

Sichler, Vance A., c/o Mrs. Art Hyzer, Reedsburg, Wis. (Apr. '44) *P*

Stuart, Charles L., Mgr., Vandergrift Water Co., Apollo, Pa. (Jan. '40) *M*

Tolburg, H. A., 251 Whittington Ave., Hot Springs, Ark. (July '35) *M*

Ward, Sylvester Edward, Asst. to Gen. Mgr., Bound Brook Water Co., 307 E. 2nd St., Bound Brook, N.J. (Jan. '43) *MP*

White, Clyde, Supt., Water Dept., Wink, Tex. (Jan. '44) *M*

Wilbur, C. C., 614 Scranton Electric Bldg., Scranton 3, Pa. (Feb. '24)

IS STEADILY RISING

is on these service records that the Cast Iron Pipe Research Association bases its slogan, "*Serves for Centuries.*"

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

PIPE LINES

New York's Underground Empire

Approximately two million lengths of pipe of which more than 95% is cast iron pipe, distribute water to the five boroughs of New York City—upwards of 5,000 miles of distribution mains which, if laid in a straight line, would reach from New York to San Francisco and nearly half way back again—this is New York's underground empire." These mains distribute more than 900,000,000 gallons of water per day. Some sources of supply are more than 100 miles distant.

A Billion Gallons Per Day

Chicago, from an inexhaustible supply, pumps more than a billion gallons a day through her one-and-a-half million lengths of pipe, 99.9% of which is cast iron pipe. The rated pumping capacity of Chicago's system is 1,900,000,000 gallons a day.

Fifteen Largest Cities

Here are some more typical figures giving the percentage of cast iron pipe used in the water distribution systems of the 15 largest cities in the United States, as recently reported by their Water Departments: Philadelphia, 98.3%; Detroit, 98.7%; Cleveland, 98.9%; St. Louis, 98.7%; Boston, 99.8%; Pittsburgh, 97.9%.

And In Treatment Plants

The wide acceptance of cast iron pipe is further evidenced by the fact that well over 95% of all the pipe in Water Filtration plants and Sewage Treatment plants, throughout the United States, is cast iron pipe. Under the ground, above ground, under water or set in concrete, cast iron pipe is the standard material.

Still Going Strong

Original cast iron mains have in some instances been abandoned or salvaged when it became necessary to replace them with larger-sized cast iron pipe. Nevertheless, a recent survey shows that some or all of the original cast iron water mains are still in service in 200 out of 212 of America's large cities; impressive evidence of long life and economy.

SERVES FOR CENTURIES

(*Continued from page 22*)

Paul Weir moved up from Assistant to General Manager of the Atlanta, Ga., Water Dept. on July 1, his promotion coming after nineteen years of service with the department as Chem. Lab. Technician, Supt. of Filtration and Asst. Gen. Mgr. In his new position he will be in complete charge of the system which he has served ever since his graduation from the Georgia School of Technology in 1928.

William Storrie, Toronto Cons. Engr., who was honored by A.W.W.A.'s Canadian Section in 1944 with presentation of the George Warren Fuller Award, has now received similar recognition from the Federation of Sewage Works Associations in winning that organization's Kenneth Allen Award for outstanding service in the field of sewerage and sewage treatment works.

Anson B. DeWolf, who spent last Christmas and New Year en route to the U.S. from Korea, headed for a Stateside Army separation center, is now associated with William Sydow in utility consulting engineering work from headquarters at Miami, Fla. As a Major in the Army Military Government in Korea, DeWolf served as Chief of the Bureau of City Planning in Seoul.

H. Fred Martin, formerly Texas sales engineer for Infilco, Inc., has joined the Garrett Engineering Co. of Houston, Tex., in the capacity of engineer and vice-president. During the war, Martin had charge of all new engineering work involved in the production of bombs and shells for the Army at the Lone Star Ordnance Plant, Texarkana, Tex.

Max K. Socha, formerly Asst. Engr. of Design for the Los Angeles Dept. of Water & Power, has been promoted to the position of Engr. of Water Distribution. As head of the distribution division, he is in charge of all construction, operation and maintenance of the entire distribution system south of San Fernando reservoir, including all storage tanks and reservoirs in the San Fernando Valley area—some 4,500 miles of mains serving more than 350,000 services. Under his supervision will be some 800 employees.

Socha's service with the department dates from 1924 when he became a draftsman in the design division. In 1925, he was assigned to hydrographic work and land classification surveys in Owens Valley, and in 1927 was transferred to structural and architectural design. When, in co-operation with the PWA, the department initiated a large scale construction program in 1936, Socha was named co-ordinator and was placed in charge of all water system construction contracts. Finally, in 1940, he was appointed to the position from which he was recently promoted.

(*Continued on page 46*)

GENUINE BITUMASTIC CARRIES THIS SEAL

K KOPPERS

GIVE LIGHTER PIPE
THIS BUILD-UP

TAKE PIPE WITH 3/16" WALL
ADD A THICK SEAMLESS COAT
OF BITUMASTIC ENAMEL HERE

AND A SPUN LINING OF
BITUMASTIC
ENAMEL
HERE

TODAY'S PRICES dictate the use of lighter pipe. The additional service that can be built into such pipe through the use of genuine Bitumastic enamels properly applied, makes that choice feasible and economical.

Bitumastic enamels can make lighter pipe last longer at a lower first cost. You will also have the matchless protection against corrosion from without and tuberculation from within that is the basis for the reputation of Bitumastic the world over.

Cross section of 30" pipe with 3/16" wall—showing actual thickness of Bitumastic coatings.

WAILES DOVE-HERMISTON DEPARTMENT
KOPPERS COMPANY INC.
WESTFIELD, NEW JERSEY

New York 4 • Philadelphia 8 • Cleveland 14 • Chicago 3 • Houston 2
Tulsa 3 • Miami 36 • San Francisco 10 • Los Angeles 1

(*Continued from page 44*)

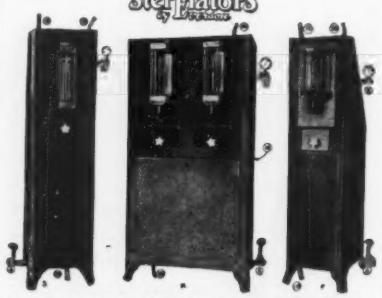
James W. Myers Jr., formerly Superintendent of the Kenosha, Wis., Water Dept., has left that position to join the staff of the Philadelphia Suburban Water Co. Taking his place in Kenosha will be H. T. Rudgal, who moves up from the position of Supt., Sewage Treatment Plant, a division of the water department. Frank I. Vilen, formerly Asst. City Engr., will become Supt. of the sewage plant and Elroy F. Spitzer, recently discharged from the Navy Civil Engr. Corps, will take Vilen's old post.

Smith-Blair, Inc., South San Francisco, recently announced the development of a new cast-bronze full circle repair clamp which can be installed in a few minutes by one man, since only simple bolting of the two halves of the unit is required. A unique feature of the device are the special molded rubber gaskets with copper armor, which are bonded to the inside of the coupling sleeves so that the fingers may slide easily over the gaskets until they overlap to form a full wrap-around. In fixing the gaskets so that they cannot wrinkle or gather under the coupling, the clamp forms a complete water-tight circle that compensates expansion and contraction of the pipe. Tests have shown that the coupling, in the 4-in. diameter size, will withstand 1,000 psi. hydrostatic pressure.

(*Continued on page 48*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

SterElators by Everson



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

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EVERSON MANUFACTURING COMPANY
221 West Huron Street, Chicago 10, Illinois

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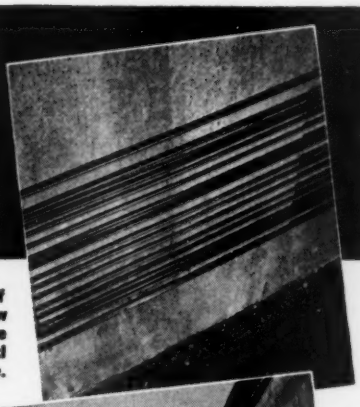
HIGH QUALITY VALVES HYDRANTS

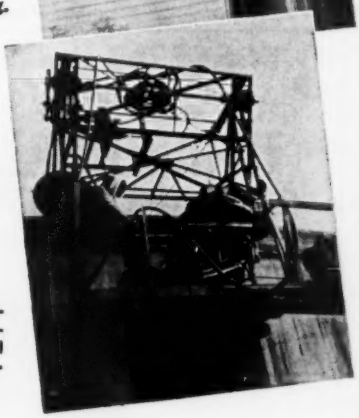
M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

Prestressed TANKS



A section of the first few turns of the prestressed wire in place.

Preloader prestressing high tensile strength wire on dome ring.



Preloader operator maintains control over wire tension.

THIRTY-FIVE MILES OF "PIANO" WIRE BALANCES THE LOAD ON TYPICAL WATER STORAGE TANK

Wire Prestressing with the automatic PRELOADER is being used on the 1,000,000 gallon water storage tank illustrated above and built for the U.S. Army Engineers at the Middletown, Pa. Air Depot by the Preload Corporation.

For a permanent army installation this prestressed tank illustrates a type of water storage which can virtually be "built and forgotten" as it will not require painting and will have little or no maintenance cost.

PRELOAD WIRE PRESTRESSING is a machine job making other methods obsolete. The wire winding machine eliminates guess work. There is close control of the tension on the wire as it passes through the wire stressing mechanism which imposes a constant predetermined stress on the wire during application, unaffected by temperature variations during construction.

For circular tanks for water storage, filtration, or sewage disposal plants PRELOAD PRESTRESSED construction offers specific economies in original cost per gallon and substantial savings over other types of construction in concrete and and steel quantities. Materials shortages do not affect construction of these tanks. They can be built immediately using local materials and labor. We have high tensile strength wire and vertical prestressed reinforcing rods in stock.

Write for our literature and send us your tank problem

PRELOAD ENTERPRISES INC.

420 LEXINGTON AVE., NEW YORK, N. Y.

Designers and Builders of Prestressed Concrete Storage Tanks and Pressure Pipe
Prestressed Concrete Bridges and Cement Lining of Pipe in Place

The Preload Corporation
New York—Boston—Washington

Preload Central Corporation
St. Louis—Chicago—Kansas City

PRELOAD

Preload Pacific Corporation
San Francisco—Los Angeles

The Preload Co. of Canada, Ltd.
Montreal—Toronto—Halifax

(*Continued from page 46*)

Charles L. Stuart, manager of American Water Works & Electric Co's Moundsville, W. Va., plant since 1943, was appointed manager of the Vandergrift plant at Apollo, Pa., on June 1, to replace P. R. Neff, who retired from that position after 30 years of service with the parent corporation. Stuart's ten years with the organization have been spent at its plants in Pittsburgh, Pa., Haddon Heights, N.J., Wichita, Kan., and Moundsville.

Crane Co., Chicago, has announced a new line of corrosion-resistant plug gate valves which combine the advantages of the straight-through flow in the wide-open position of conventional gate valves and the throttling service obtainable from globe valves. Of outside-screw-and-yoke design, the new valves have bolted bonnet joints and are available with either screwed or flanged ends in sizes from ½ to 2 in. Although regularly furnished in either 18–8 Mo or Monel metal, they can be made to customer specifications in various other alloys for particular corrosive conditions. Further details regarding the product and the extensive laboratory and field tests conducted may be obtained from the company's office at 836 S. Michigan Ave., Chicago 5, Ill.

(*Continued on page 50*)

SERIES 100

• Tested and approved by National Board of Fire Underwriters.

• Conforming to specifications of the American Water Works Association.

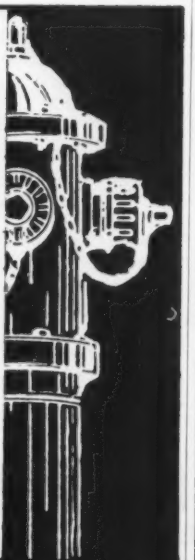
• Positive drain and automatic shut off.

• Five sizes from 1¼ to 6″ opening.

• Quick action, simple, easily repaired.

• Send for specification sheets.

JOHN C. KUPFERLE FOUNDRY CO.
St. Louis



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FIRE HYDRANTS

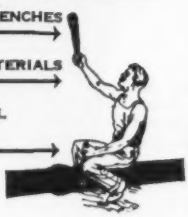
3 *Money, Time and Labor Saving Features of*

UNIVERSAL
CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.



For water supply, fire protection systems, sewage disposal systems, industrial, and irrigation. Flexible.

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THE CENTRAL FOUNDRY COMPANY
386 FOURTH AVENUE, NEW YORK 16, N. Y.

Gentlemen: Send us information and catalog on UNIVERSAL CAST IRON PIPE.

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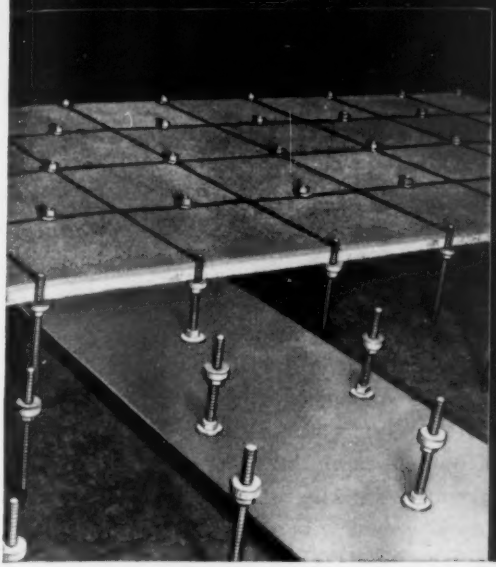
STREET_____

CITY_____

CAMP POROUS BOTTOMS

for Rapid Sand Filters . . .



Superior to conventional filters, these porous bottoms assure improved filtration, considerably longer filter runs and ability to pass increased rate of flow. Containing no layers of graded gravel, they permit repairs and inspections to be made readily and without the heavy cost of handling the sand and gravel.

You'll like these positive advantages

- Readily adaptable to existing filters . . . make possible eliminating strainers and gravel layers with minimum change.
- Elimination of graded gravel reduces filter height in new plants . . . effects worthwhile savings.
- Elimination of gravel removes all possibility of filter bed non-uniformity.
- Reduce quantity of wash water required.
- No strainers to shear off due to lateral movements.
- Provide back wash head loss of two feet total. Provide better back wash distribution than any other system.

WRITE FOR BULLETIN 12S12

WALKER PROCESS EQUIPMENT INC.

YEARS OF EXPERIENCE TOGETHER IN EQUIPMENT ENGINEERING

AURORA • ILLINOIS

PROQUIP

(*Continued from page 48*)

C. C. Wilbur has, since June 1, been in charge of the Scranton, Pa., field office of Gannett Fleming Corddry & Carpenter, Inc., Cons. Engrs. of Harrisburg, Pa. His duties in his new job involve the design of an interceptor sewer and complete treatment plant for Scranton and plants for several nearby communities now discharging sewage into the Lackawanna River. Immediately before accepting this position, Wilbur was in Washington, D.C., on a sales job, and earlier he was Chief Engr. of the Minneapolis-St. Paul Sanitary Dist.

The Pennsylvania Salt Mfg. Co. opened a new chlorine, caustic soda and DDT plant at Portland, Ore., on June 21, the first of its kind in the Columbia River district and one of the pioneer producers of basic chemicals in the state. The new plant, built beside the company's Portland chlorate plant, is the latest result of a 20-year project to expand with the growth of Pacific Northwest industry. Its operation will push capacity for production of the two chemicals to 200 tons per day in that area. The opening of the new plant, largest expansion project completed by the company in recent years, followed closely its announcement that, for the first time since 1912, it will seek outside capital and, for the first time in its 97-year history, will seek it through the sale of preferred stock rather than the common stock heretofore issued. The new capitalization of $5,000,000 is to be used in a general $7,500,000 expansion program.

Builders-Providence, Inc., Providence, R.I., has announced a new development in the continuous weighing of dry materials on conveyor belts. Called the "Conveyoflo Meter," the new unit utilizes diaphragms instead of the usual knife-edge-beam principle for metering flow of dry materials by weight, thus permitting simpler construction and saving of space. Applied to industrial processes, the scales of the device may be used to proportion and control, as well as weigh, the feed of one or more dry materials and to control proportional flow of liquids.

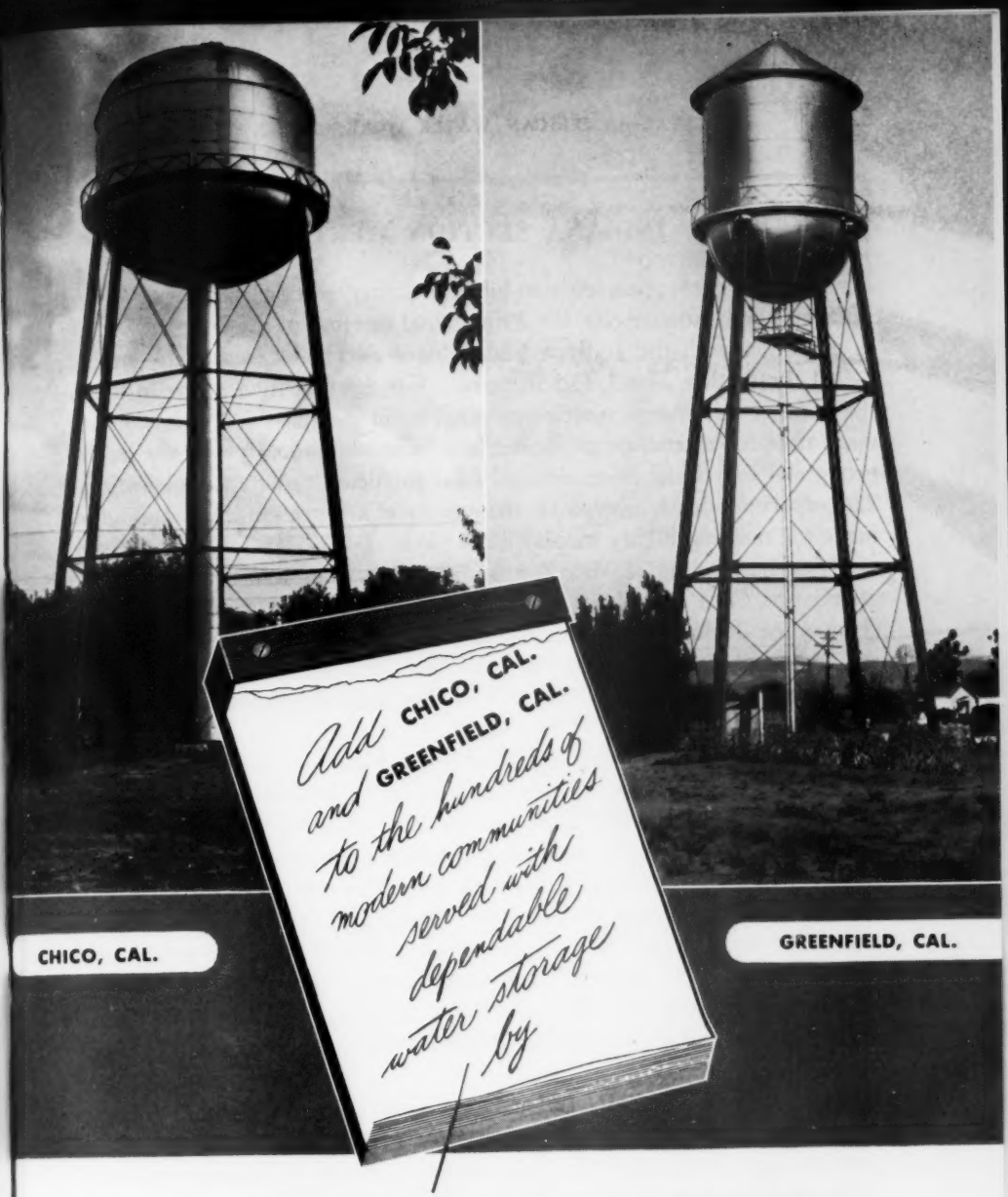
(*Continued on page 52*)

ZECO GREENSAND ZEOLITE

ZECO and HI-ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.

90 WEST STREET **NEW YORK 6, N. Y.**



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ELEVATED STEEL TANKS

Typical of the country-wide activity in municipal water storage improvements are these West Coast Pittsburgh-Des Moines Elevated Steel Tank installations. The Chico tank is of Double-ellipsoidal design, 300,000 gallons in capacity, at a height of 120 ft. to overflow. The 100,000-gallon Greenfield tank is our Hemispherical Bottom type with cone roof; height 75 ft. to bottom. *Let us discuss your own requirements, in any tank type or capacity.*

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PITTSBURGH, PA., 3424 NEVILLE ISLAND—DES MOINES, IOWA, 925 TUTTLE ST.
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DALLAS, 1229 PRAETORIAN BUILDING · SAN FRANCISCO, 631 RIALTO BLDG.
SEATTLE, 532 FIRST AVENUE, SOUTH

(*Continued from page 50*)

INDIANA SECTION MEETING

Following the past custom of alternating section meetings between Lafayette and Indianapolis, the 39th annual meeting of the Indiana Section, in affiliation with the Indiana State Board of Health, was held on May 7–9 at the Antlers Hotel, Indianapolis. For the first time in the history of the section, the annual meeting covered a three-day period, thus allowing more time for discussion of the various technical papers presented and for group and individual discussions of local problems. A total registration of 224 superintendents, operators, manufacturer's representatives and guests made the meeting highly successful.

On the evening of May 7, a buffet and smoker was held for those in attendance, Cecil K. Calvert presiding and Louis Finch acting as master of ceremonies during the entertainment. A technicolor movie furnished by the Indianapolis Motor Speedway on the "Crucible of Speed" was shown, and this was followed by a "Pot of Gold" contest and a program of dancing and music.

The noon luncheon held on May 8 was high-lighted by the address of Dr. L. E. Burney, Indiana State Health Comr., who spoke on "The Program of the Indiana State Board of Health," pointing out the inadequacy of Indiana's past efforts in combating communicable diseases and suggesting the need for a much more comprehensive health program in the state. Reporting that Indiana spends less per capita for its public health program than 43 of the 48 states, he indicated that the condition was remedied somewhat by the action of the 1947 Legislature in more than doubling the appropriation for the State Board of Health for the next two years. Dr. Burney further pointed out the need for establishing local health units to decentralize the health program.

President Wendell R. LaDue gave a very interesting talk following the annual banquet, stressing the need for greater interest by the Association, through its members, in such matters as stream pollution, water works standards, planning, finance, education and public relations. Another feature of the banquet was the announcement of the election of Leo Louis, formerly sanitary engineer of the Indiana State Board of Health and now City Engineer, of Piqua, Ohio, to receive the George W. Fuller Award for the year 1947.

An extremely interesting talk was given by Wayne Guthrie, City Editor, *Indianapolis News*, at the luncheon held on May 9. His discussion entitled, "Ringside at Bikini," was a review of both atomic bomb tests at Bikini, which he had witnessed.

Thomas J. Burrin, outgoing chairman, presided at the opening technical session which convened on the afternoon of May 7. Charles H. Bechert,

(*Continued on page 54*)

WF

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Manufactured in Sizes 2" to 96"—

Bell and Spigot Pipe **Special Castings**

Flanged Pipe **Flexible Joint Pipe**

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Works

Phillipsburg, N. J.
Everett, Mass.

(*Continued from page 52*)

Director, Div. of Water Resources, Indiana Dept. of Conservation, spoke on "Safeguarding Indiana's Water Resources," discussing the increased demand for municipal and industrial water supplies during the war and since, as related to the declining ground water levels in many industrial cities and communities (*see* p. 792, this issue). Dr. C. Mervin Palmer, Asst. Professor of Botany, Butler Univ., then presented a timely paper on "Algae in Water Treatment," pointing out the need for water free of all microorganisms and especially disease-producing forms and those causing turbidity, unsightliness, tastes and odors. Algae being one of the great trouble makers to the water works operator, Dr. Palmer gave information about the various types encountered, indicating how to identify and control these organisms. Don H. Maxwell, Cons. Engr., Alvord, Burdick & Howson, Chicago, followed with an address on "Planning Capacity for Elevated Storage Tanks" (*see* July issue, p. 644).

The first paper of the morning session on May 8 was by O. M. Leonard, Cons. Engr., Michigan City, who spoke on corrosion control, stating that the customers' demand for a softer water has imposed an increasing corrosion problem on the water works operator. He pointed out that corrosion is increased as the protective coating deposited by the normally stable or over-saturated water is removed by the softer water being fed through the distribution system. Leonard also discussed various interior coating and other methods of controlling corrosion resulting from softened water. A review of "Progress in the Design of Elevated Steel Tanks" was then given by Donald A. Leach, Dist. Sales Mgr., Chicago Bridge and Iron Co. (*see* July issue, p. 651).

James R. Brown, Vice-Pres., National Water Main Cleaning Co., discussed methods of cleaning water mains and their economic aspects in cases where the carrying capacity has been materially reduced by friction-producing debris, tuberculation, incrustation, sedimentation, algae and bacteria growths. He reported the savings effected by the cleaning of a water main in South Carolina where the rehabilitation of approximately 5 miles of 20-in. and 12-in. pipe showed an over-all power saving of $1,396 per month and paid for the cost of cleaning in three months. Several of those attending the meeting witnessed a practical demonstration of cleaning a section of water main when the Indianapolis Water Co. cleaned a 1,500-ft. section of 6-in. main on the morning prior to the meeting. Following this discussion, Louis Finch of the Indianapolis Water Co., spoke on the extension of existing water mains and discussed the determining factors in such extensions, pointing out that the Indiana Public Service Commission has promulgated rules governing extensions of mains by private utilities, which, though they do not apply to municipally owned utilities, are very good rules to follow. At the end of the paper, considerable discussion was held on the subject of main extensions, particular attention being devoted to the matter

(*Continued on page 56*)

"HTH is low in cost, easy to apply!"
—Joseph E. Moore, Supt., Burlington City Water Works, Burlington, Vt.

"I wouldn't be without HTH!"
—O. F. Stompler, Supt., Langhorne Spring Water Co., Langhorne, Pa.

"HTH has no equal!"
—Everett Harris, First Engineer, Moberly Water Dept., Moberly, Mo.

"We play safe with HTH!"
—Three Rivers Filtration Plant, Fort Wayne, Ind.

"HTH sterilizes more thoroughly!"
—George E. Regester, Jr., Engineer and Supt. of the Borough of Kennett Square, Pa.

SANITATION HTH *is available in cases of nine 5-lb. cans and in 100-lb. drums.*

IT'S EASY TO UNDERSTAND why prominent water works officials praise Sanitation HTH. They use it—and prefer it—for regular or emergency hypo-chlorination of water . . controlling algae . . cleaning filtration screens . . . treating coagulation basins and pipelines . . . decontaminating broken mains . . . sterilizing new or extended mains . . . all-around sanitation. Write for Mathieson's 80-page booklet—"Hypo-Chlorination of Water." In addition to describing all standard sanitation practices, it shows how to employ Sanitation HTH in many unusual ways. Get your copy; it's free to water works men. THE MATHIESON ALKALI WORKS (INC.), 60 E. 42nd St., New York 17, N.Y.

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(*Continued from page 54*)

of charges for fire hydrants, in which there is no uniformity of practice in Indiana.

A very timely paper was presented in the afternoon session on "Organization and Financing in Indiana" by Otto Jensen, Exec. Secy., Indiana Redevelopment Commission, following which the subject of "Methods of Fixing Public Fire Protection Charges" was ably presented by Fred R. Witherspoon, Sr. Water Works Engr., Public Service Commission of Indiana (*see* July issue, pp. 619, 623). Closing the program was a paper on the subject "Are War Surplus Materials Worth Purchasing?" by H. J. Draves, Supt., Michigan City Water Works, who very ably handled this difficult subject, relating the experiences of many water works men in trying to obtain surplus war materials. He pointed out that, although surplus materials are generally worth what they cost, unless the utilities are in a position to devote most of their efforts for a considerable period of time to follow the negotiations through all of the necesesary red tape, they have little chance of obtaining them.

The final technical session on May 9 was opened by Marshall P. Crabill, Asst. Supt. of Purif., Indianapolis Water Co., who discussed opera-

(*Continued on page 58*)

Prevent Rusting

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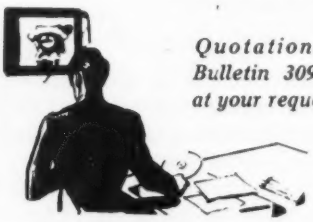

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Fittings can be supplied for all special water supply line requirements. This company has enjoyed a wide experience in the field of water supply line engineering and construction over a long period of years and this experience and training are available to water works officials and engineers. Information available upon request.

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(*Continued from page 56*)

tors' manuals, stating that, as a single manual cannot cover in detail all the specific phases of operation which are particular to an individual plant, there is need for a published manual to be supplemented with detailed instructions essential to plant operation. He concluded that, to be of value to an operator, a manual should contain a job analysis and all necessary operating instructions correlated in such a manner that the operator will have an over-all picture of a smooth running organization. Glen Garman, Supt., Lafayette Water Works, spoke on meter testing and the necessity of periodically testing meters, pointing out the value of meter installations, and illustrating his point with a story of how a decrease of approximately 30 per cent in the yearly consumption of water was effected after his city was completely metered.

The final paper of the meeting was presented by W. E. Howland, Prof. of San. Eng. at Purdue Univ., who discussed water works economics, emphasizing the fact that it will pay dividends for any water works improvements to be properly "engineered" (*see* July issue, p. 630).

CHARLES H. BECHERT,
Secretary-Treasurer

(*Continued on page 60*)

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(*Continued from page 58*)

WESTERN PENNSYLVANIA SECTION MEETING

The joint meeting of the Western Pennsylvania Section and the Western Division of the Pennsylvania Water Works Operators Association at Pittsburgh on June 12 and 13, was attended by 135 members and guests. A day and a half of technical sessions, together with a luncheon and banquet on the first day, constituted the program. Special entertainment was provided for the ladies.

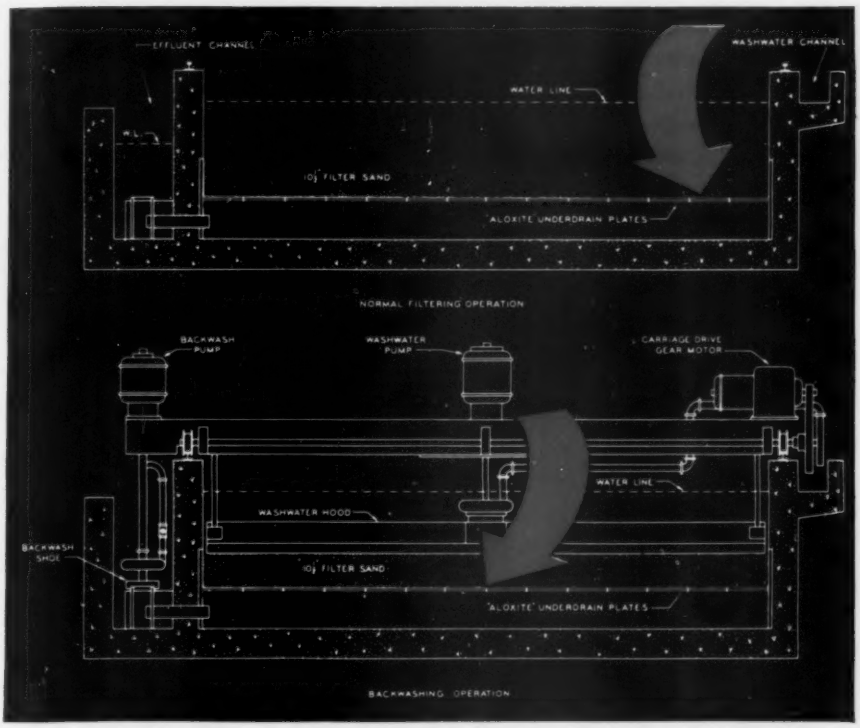
Featured at the first technical session, which was presided over by Vice-Chairman E. C. Goehring, were papers on ground water supplies. John H. Adamson Jr., Geologist, U.S. Geological Survey, presented a "Review of Ground Water Collection and Development Methods"; "The Installation of a Radial Water Collector" was discussed by Douglas E. Chase, Mgr., Municipal Authority of the Borough of West View; and the "Water Field Development at Ambridge, Pa." was described by Edward C. Taggart, Supt. of Water Works of the city (*see* pp. 739, 747, 750, this issue). A demonstration of "Activated Silica for Improving Floc Formation by the Baylis Process," presented by William Baumgartner and Walter Placzankis of the Grasselli Chemicals Dept., E. I. duPont de Nemours & Co., Inc., of Cleveland, Ohio, proved very stimulating, and much interest was aroused by the discussion of James B. Stowe, Chief Plant Engr., New Kensington Water Authority, who described the silica coagulant aid method with chlorine as the activating agency.

The afternoon session was presided over by Chairman L. S. Morgan and centered around the "Effects of Coal Strip Mining Upon Water Supplies," which was the title of a paper by Raymond H. Snyder, Asst. Chief Engr., Water Utilities Service Corp., McDonald, Pa. (*see* p. 751, this issue). Discussions of this topic were presented by Joseph A. Beck, Attorney, Pittsburgh; William J. Murdoch, Cons. Engr., Pittsburgh; J. Z. Columbia, Chemist, Langeloth Water Co., Burgettstown; and Carl Kear, Mgr., Municipal Authority of the Borough of Minersville. The "New West Penn Water Co. Supply," built to replace a supply that had been damaged by pollution from such strip mining operations, was described by John T. Campbell, Partner, The Chester Engineers, Pittsburgh (see p. 770, this issue). As a result of these papers and discussions, a committee was appointed to consider drafting a resolution concerning strip mining on the watersheds of public water supplies, to be presented to the Sanitary Water Board of the State Dept. of Health.

News of the parent Association was presented by the A.W.W.A. Secretary Harry E. Jordan, who also reported informally the results of a ballot taken among members in Pennsylvania on the desirability of forming a state-wide section. An address by Association President Wendell R. LaDue highlighted the annual banquet.

(*Continued on page 62*)

Serving Large Paper Mill and Town



Hardinge Automatic Back Wash Rapid Sand Filter Using ALOXITE Porous Plates

Operated steadily for more than a year, this 1100 sq. ft. Hardinge filter, equipped with ALOXITE aluminum oxide underdrain plates, has proved eminently satisfactory. Installed by the paper mill, it supplies water to both mill and town.

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Adaptable to new or old, large or small gravity and pressure units, the ALOXITE underdrain system provides highly worth while savings. Check its possibilities for your filters. Complete details will be furnished by our engineers. Write Dept. P-87, The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

Underdrain Plates

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(*Continued from page 60*)

D. E. Davis, the immediate past-chairman of the section, presided over the final technical session. A paper on "Unaccounted-for Water" was presented by Charles Haydock, Cons. Engr., Philadelphia, and discussed by James G. Griffiths, Gen. Mgr., Municipal Authority of New Kensington, and G. V. Gustafson, Engr., Morris Knowles, Inc., Pittsburgh. B. A. Noel, Sales Mgr., Pittsburgh Pipe Cleaner Co., presented a paper on "Economics of Pipeline Rehabilitation." The "Operation of Pension Plan at Erie, Pa." was described by John B. Johnston, Supt., Bureau of Water of that city, and was discussed by T. B. Braman, Mgr., Citizens Water Co., Washington, Pa.

A vote of thanks was extended to Earle P. Johnson, retiring Secretary-Treasurer, who had served the section faithfully since its organization. The George Warren Fuller Award Committee selected Charles H. Young, Dist Engr., State Dept. of Health, Meadville, who is retiring as Section Director, for his outstanding works in the sanitary engineering field and his services to the section.

L. S. MORGAN
Secretary-Treasurer

(*Continued on page 64*)

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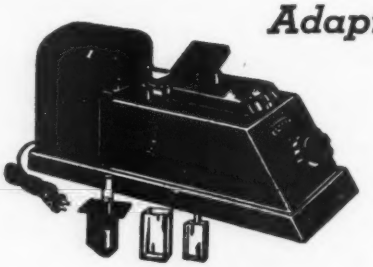
Adaptable for Use in Water Analysis



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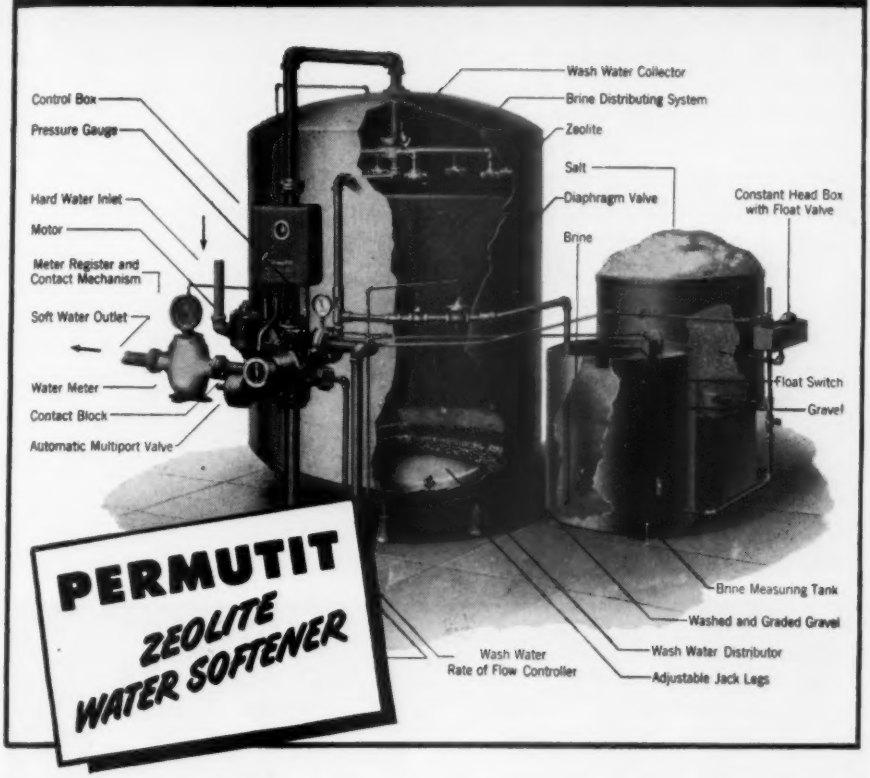

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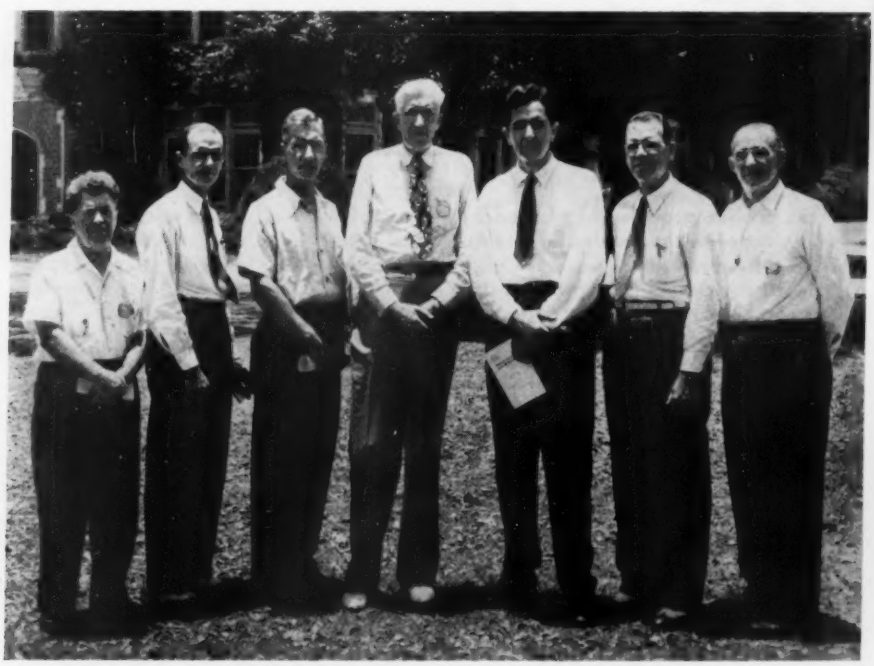
PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 62*)

At the Univ. of Florida, on June 9–14, 134 water and sewage works men gathered to attend the 15th Annual Short Course and Conference on Water Supply & Sewerage held under the auspices of the State Board of Health, A.W.W.A.'s Florida Section, the Florida Sewage Works Assn., the Florida Water & Sewage Works Operators Assn. and the General Extension Div. of the Univ. of Florida. Features of the meeting were talks and demonstrations by outstanding men in the field of water and sewage works and five half-day sessions devoted to bacteriological laboratory procedures. Attendance certificates were issued to all registrants who remained for the full meeting and 44 water and sewage plant operators took examinations for performance certificates.

One result of the deliberations of the sponsoring organizations was the formation of the Florida Committee on Water Supply and Sewerage Education to develop a continuous training program for the water and sewage plant operators of the state. Appointed to this new group were: Chairman, David B. Lee, Chief San. Engr., State Board of Health; A. P. Black, College of Arts & Sciences, Univ. of Florida; J. R. Hoy, Secy.-Treas., Florida Sewage Works Assn.; Harry T. Oberly, Chairman, Florida Sec., A.W.W.A.; Thomas Paul, Florida Water & Sewage Works Operators Assn.; G. M. Turner, General Extension Div., Univ. of Florida; and Clifford D. Williams, College of Eng., Univ. of Florida.



PAUL, WILLIAMS, HOY, BLACK, TURNER, LEE, OBERLY

(*Continued on page 66*)

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● Hard water acts like an electrolyte. A galvanic action occurs when iron and a copper alloy are both used in a water meter measuring hard water. Minute currents flow from the bronze working parts to the iron case. This action minimizes corrosion of working parts. If deposits occur, they tend to form on the casing where they do no harm.

In most types of hard water, the Niagara galvanized iron case meter is usually recommended. In softer water where the pH is below approximately 7.5, and for most water obtained from surface sources, the American with bronze case is commonly specified.

50 years' experience proves that both models are necessary and each has its proper place.

Send for literature on the design of Niagara, the successful galvanized iron case meter.

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WATER METERS
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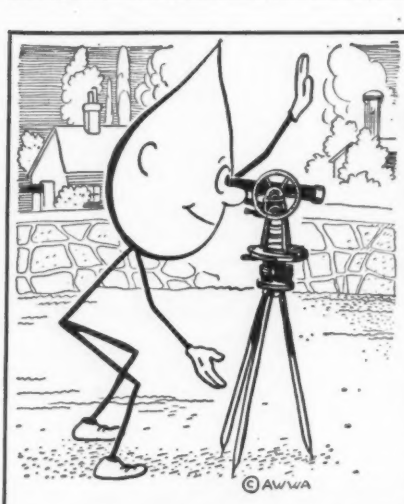
Simplicity

(*Continued from page 64*)

The Geophysical Instrument Co., Arlington, Va., recently announced improvements in the construction of their Gish-Rooney Earth Resistivity Apparatus to eliminate spurious effects and thus permit more accurate estimation of subsurface conditions. Developed some 20 years ago by two engineers at Carnegie Inst., Washington, D.C., the apparatus is designed to provide data on subsurface electrical resistances, upon the basis of which conclusions may be drawn regarding geological formations and conditions. Distributed commercially for the past 13 years, the apparatus has been applied to a variety of petroleum, mineral and construction engineering prospecting jobs as well as to the location and measurement of underground water-bearing formations.

Engineers—civil, sanitary, electrical, mechanical, refrigeration and air-conditioning—are needed to fill overseas positions with the U.S. Army Engineers at Guam, Philippines, Okinawa, Japan, Korea and in the Caribbean areas. Salaries range from $3,306 to $8,875 per annum. Housing for dependents is not generally available.

Application should be made to the Civilian Personnel Branch, Office of the Chief of Engrs., Building T-7, Gravelly Point, Va., forwarding a completed Civil Service Com. Form 57, in duplicate.



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NEWS OF THE FIELD

Certain changes of great importance in A.W.W.A. Committee arrangement and leadership were made during the San Francisco Conference.

Following careful consideration by the Board, the By-Laws of the Association have been amended to establish a Committee on Water Works Administration, which will be equal in standing with the Committee on Water Works Practice. In general, this new co-ordinating group will assume direction of all Association committee activity which has to do with problems or practices in the administration or management of water works systems. Past-President LaDue was named by President Veatch to head this important project.

Louis R. Howson of Chicago, Past-President of the Association, was named to succeed Malcolm Pirnie as Chairman of the Committee on Water Works Practice. Howson brings to this task the combination of broad engineering experience and mature judgment, both of which have characterized Pirnie's chairmanship and both of which are essential to the progress of this committee.

Malcolm Pirnie, who has been Chairman of the practice committee since 1928 and, prior to that, its Secretary from its organization by George W. Fuller in 1920, was relieved of the chairmanship at his own request and with the expressed regret of the officers and directors of the Association.

Charles H. Capen was named as Chairman of the Publication Committee to succeed Vice-President Linn H. Enslow, who had held this chairmanship since 1935. Capen has been a member of the committee for a number of years and has contributed much to the Association's conference program planning.

The A.W.W.A. is fortunate in having had such fine leadership as these committees have had under Pirnie and Enslow. Likewise it is fortunate in having men such as Howson, LaDue and Capen to carry on the work upon which the progress made by A.W.W.A. so greatly depends.

Much more that was important, much that was entertaining and a great deal that was unprecedented happened at San Francisco. A total of 1,955 members and guests registered for the twin meetings and A.W.W.A.'s registration total of 1,546 established a new record. Only five states failed to send delegates to the meeting and the number that crossed the Rockies to be present was a fine tribute to the importance of the conference. Of A.W.W.A.'s total, 692 registrants were native Californians;

(Continued on page 2)

(*Continued from page 1*)

but more than three hundred spanned the continent from the East Coast states. Canada sent 20, Hawaii, 16 and far-off Australia, one.

While the more than five hundred ladies were riding cable cars, watching seals, souvenir hunting in Chinatown, seeing San Francisco's innumerable attractions, and being royally feted with teas and luncheons and fashion shows, water works men spent their days in the Civic Auditorium attending a full program of technical sessions and examining the largest exhibit of water works equipment ever assembled. And each evening held more than its share of entertainment, both planned and impromptu.

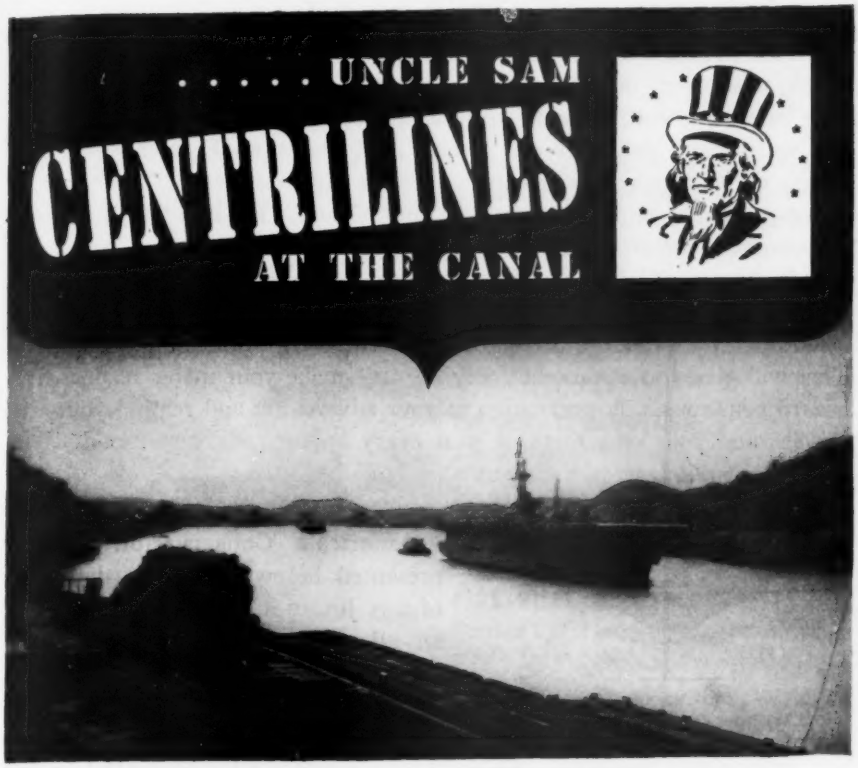
Capping the week of work and play, was the Annual Dinner and Dance, a sell-out success from the first bite of crab to the last bar of "Goodnight Sweetheart." Those who attended will long remember the after-dinner program which W&T's musician Bill Orchard and J-M's baritone, John Gill, got off to an auspicious start. Wendell LaDue's swan song and Tom Veatch's "howdy" were high spots, as was the presentation of awards to: Louis R. Howson—Goodell Prize; E. L. Filby—Diven Medal; Malcolm Pirnie and Lawrence H. Cook—Honorary Membership; and to 22 others, their sections' George Warren Fuller Awards.

Membership at the time of the meeting reached a high of 6,632, but no one was able to challenge the California Section for possession of the Old Oaken Bucket, which it has held continuously since 1939. The Nicholas S. Hill Jr. Cup, however, found a new holder in the young Kansas Section, which built up the amazing total of 155.7 membership points in defeating the runner-up Southwest Section, which had held it for two years. Michigan and California were also-rans in that order. And the Franklin Henshaw Cup became an international one when the Cuban Section with an attendance record of 72.22 at its Havana meeting nosed out the North Carolina Section whose total was 69.14. In close contention, with percentages above 60, were the Kansas, West Virginia and Pacific-Northwest Sections in that order.

Completing the program at noon on July 25, Easterners, at least, took regretful leave of the cool breezes of San Francisco and of their fellows with a promise to *"See you in Atlantic City next May."*

Fire Prevention Week will be October 5–11 this year by proclamation of President Truman, the governor-general of Canada and the governors of several states. But their proclamations are not enough, nor is it enough to be fire-prevention conscious for one week in October or any other month. Fire doesn't work an eight-hour day, nor does it take a 51-week vacation. The 1,700,000 fires that cost the U.S. more than a half-billion dollars last year occurred at the rate of one every 20 seconds—day and night—week in, week out. The tragedy is that all of them could have been prevented. And this year the record is much worse.

(*Continued on page 4*)



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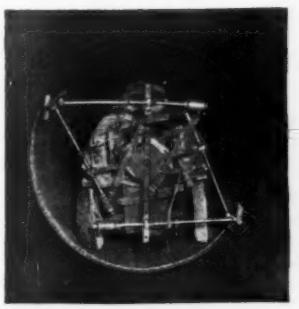

The Centriline process is a rapid, economical method of reconditioning pipe lines 24" and larger. After cleaning, a thoroughly premixed cement mortar lining of desired thickness is applied centrifugally without rebound. This dense quality product is mechanically trowelled to a smooth finish providing maximum carrying capacity which is permanently sustained. This work is performed underground, in place.

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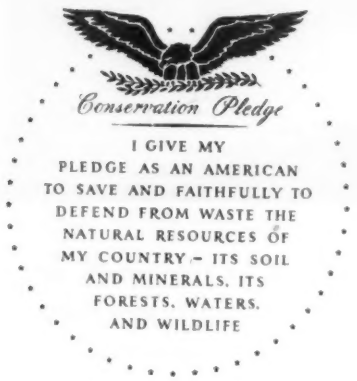
RESTORES AND PROTECTS PIPE-LINE CARRYING CAPACITY

(*Continued from page 2*)

Fire Prevention Week is fine, but until every week is Fire Prevention Week, until every one of us makes prevention a personal affair on a full-time basis, fire will continue to devastate our natural resources, consume our wealth and endanger our lives. And water works men should be among the first to realize that prevention is their business. "An ounce of prevention" may be worth only "a pound of cure," but it is worth millions of pounds of water.

Right now the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass., is offering a collection of promotional material suitable for use by water works departments in the Fire Prevention Week drive. That will give you a start, but only a start—make your meter readers fire-hazard conscious, talk prevention in your advertising and remind your employees and your customers of it at every opportunity year-round—*Stop Needless Fires.*


Conservation Pledge
I GIVE MY PLEDGE AS AN AMERICAN TO SAVE AND FAITHFULLY TO DEFEND FROM WASTE THE NATURAL RESOURCES OF MY COUNTRY – ITS SOIL AND MINERALS, ITS FORESTS, WATERS, AND WILDLIFE

America's Conservation Pledge, presented herewith and on the cover of this JOURNAL, is the rallying cry of an all-out campaign to conserve the nation's vanishing natural resources. Winning entry in a national competition sponsored last year by *Outdoor Life* magazine with the collaboration of leading conservationists, scientists and educators, the pledge was presented to Secretary of the Interior Krug in a public ceremony last December. It is now being used and publicized by many schools, patriotic and civic organizations, sportsman's clubs and other groups active in furthering the drive for conservation.

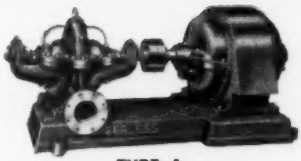
Completely dependent upon natural resources for their stock in trade, water works men are more directly concerned with the success of the campaign than are most others. Where past extravagance and the tremendous demands of a war economy have exacted a heavy toll, preservation and protection of the remaining water sources have become grave national problems. More than diminishing ground water levels, such allied difficulties as are caused by soil erosion and the destruction of watershed forest cover must be considered real problems by the water works man. Certainly then he should be first among the supporters of any campaign which can arouse public interest and action in the development of a conservation-minded nation.

(*Continued on page 6*)

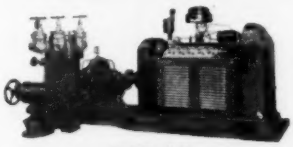
Where there's a PUMP in your Plan

SPECIFY

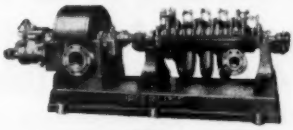
PEERLESS



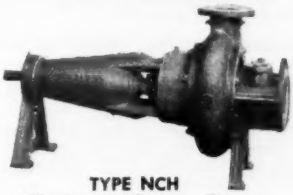
TYPE A
General Service Pump



TYPE AF
Fire Pump Underwriters' Approved



TYPE B
Boiler Feed Pump



TYPE NCH
Horizontal Sewage Pump

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District Offices: Canton 2, Ohio; Philadelphia: Suburban Square, Ardmore, Pa.; Atlanta: Rutland Bldg., Decatur, Ga.; Dallas 1, Tex.; Los Angeles 31, Calif.

PEEERLESS CENTRIFUGAL PUMPS ARE MANUFACTURED IN AN EXTENSIVE SERIES OF ADVANCED TYPES, SIZES AND CAPACITIES UP TO 70,000 G.P.M.

For diversified, heavy-duty services in Municipalities and Waterworks, Peerless centrifugal pumps incorporate many proven design features for extended pump life, minimum down-time and operative economy.

GENERAL SERVICES

Peerless type A pumps afford top-flight, continuous duty operation with capacities from 50 to 70,000 g.p.m. Heads: 15 to 300 ft. All types of drives: 1 to 1000 h.p. Sizes: 2″ to 42″ discharge. Split-case, single stage, double suction type.

FIRE PUMPS

Peerless Underwriters' Approved fire pumps are available for all fire protection services. Capacities: 500 to 2000 g.p.m. Pressures: to 150 lbs.; single and double stage types, for electric, engine, turbine drive or combinations.

BOILER FEED

Peerless type B multi-stage pumps are for Boiler feed services requiring capacities of 50 to 900 g.p.m. and handling pressures up to 700 lbs. For electric and other type drives from 60 to 350 h.p.

SEWAGE AND RE-LIFT

Peerless Non-Clog type NCH pumps are designed for dry basin installation in capacities from 100 to 7000 g.p.m. Heads: 12 to 70 ft. All types of drives: 1 to 100 h.p. Unique repelling shroud vanes utilized for a most dependable method of pumping entrained solids. Vertical type also available.

PEERLESS PUMPS

FOR MOST SERVICES IN ALL INDUSTRIES

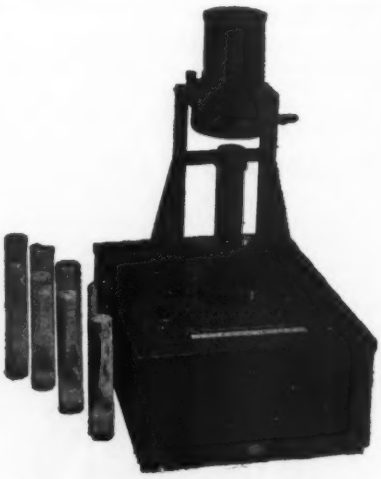
(*Continued from page 4*)

Many organizations have already enlisted their efforts in spreading the doctrine of "Serving by Saving" in their advertising, on their letterheads and through their publicity. *Outdoor Life* magazine is distributing, at cost, sheets of stamps, printed with the above design, for use as seals on letters and packages. Everyone is being asked to make his contribution—not in money, but in effort, care and co-operation.

(Conservation seals, in units of 42 sheets of 24 stamps each, may be obtained direct from *Outdoor Life*, 353 Fourth Ave., New York 10, N.Y., at a cost of $5 per unit. Payment with order is requested to reduce the clerical burden.)

Typhoid continues on the wane, at least in upstate New York, where, during the last decade, each year has seen a 25 per cent decline in incidence. According to State Dept. of Health statistics, only 53 cases occurred in 1946, as against 71 in 1945, and the downward trend persisted through the first six months of 1947. Improved methods of discovering and controlling chronic carriers and continued application of sanitary controls promise a virtual end to the typhoid hazard in the upstate area within a short time.

(*Continued on page 8*)



LUMETRON

Photoelectric Colorimeter Mod. 450 for Nessler Tubes

A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

- Turbidity tests in terms of APHA (ppm) scale.
- Color tests in terms of APHA (mg Pt) scale.
- Suited for determination of ammonia nitrogen, nitrate, nitrite, and for all other colorimetric tests according to APHA "Standard Methods."

Operates with all "low-form" Nessler tubes 32 mm O.D., 200 mm high. Requires no matched sets of tubes.

LUMETRON Mod. 450 eliminates the uncertainties of visual matching methods. It requires no permanent color standards and furnishes reproducible results independent of individual judgment and of light conditions.

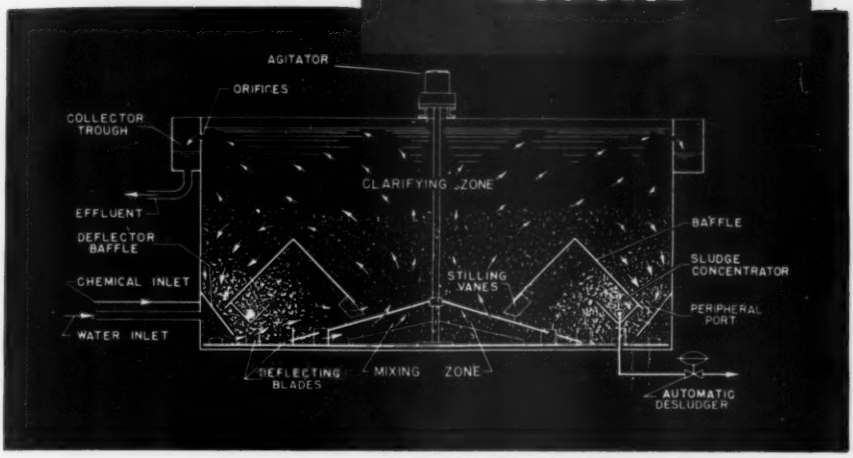
Write for literature to

PHOTOVOLT CORP.

95 Madison Ave. New York 16, N. Y.

Clearer Soft Water in Less Time

The LIQUON Sludge Contact Reactor



If your water supply requires the removal of hardness, turbidity, color, iron, manganese, silica or fluorides, investigate the LIQUON SLUDGE CONTACT REACTOR.

This highly efficient unit coagulates or softens the water in a fraction of the time required by ordinary mixing and settling tanks, and does so more completely, in less space, and at less cost.

Also, note these important distinctive benefits:

- Cylindrical tank—saving in concrete costs
- All the chemicals are completely utilized
- Clarified water thoroughly separated from the sludge
- No sludge carry-over
- Concentrated sludge discharged automatically

The LIQUON SLUDGE CONTACT REACTOR "stabilizes" the water when used in connection with the cold lime soda process. Write for Bulletin.

LIQUID CONDITIONING CORPORATION

114 East Price Street, Linden, New Jersey

Engineering Service Representatives in Principal Cities

Liquon

EVERY PROCESS . . . EVERY TYPE OF EQUIPMENT
for conditioning of water and other liquids

(*Continued from page 6*)

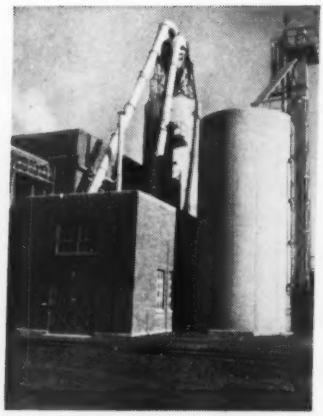
5,000,000 pages of German technical industrial data, including 145,000 patent applications, are now in the hands of the Department of Commerce Office of Technical Services on 5,000 reels of microfilm. This record of 500,000 different documents represents the most important detailed data upon German technology that has been obtained, and supplements and extends the work of the teams of experts which operated in this the European area during the war and immediately after. Most of these data were photographed from original German documents in industrial plants, universities and Government offices by American specialists who were expert in both their respective technical fields and in the German language.

The Department plans to make available in its *Bibliography of Scientific and Industrial Reports* a complete list of the 5,000 reel titles as well as abstracts of many of the different subjects on the reels just as soon as the work of organizing and evaluating the various documents can be completed. Meanwhile, the Office of Technical Services has issued an S.O.S. to technical societies and trade associations for the loan of experts in the various scientific fields to undertake the tremendous task of exploiting the wealth of data.

(*Continued on page 10*)

Be Sure to Specify CYANAMID

SULFATE OF ALUMINA



Partial exterior view of Cyanamid's new alum plant at Hamilton, Ohio. As at other Cyanamid plants, rigid control methods assure highest quality Sulfate of Alumina.

CYANAMID'S uniform high quality of product assures you:

maximum removal of taste and odor

maximum freedom of flow

maximum pH range of precipitation (much wider than other coagulants)

minimum corrosion of equipment (much less than other coagulants)

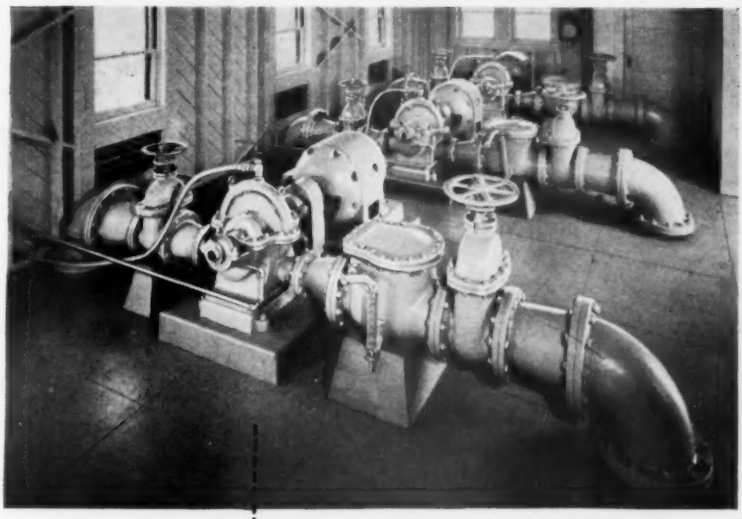
no clogging of dry feed machines

Your inquiries are welcome. Address our nearest office.

Industrial Chemicals Division AMERICAN CYANAMID COMPANY

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

District Offices: Boston, Mass. • Philadelphia, Pa. • Baltimore, Md. • Charlotte, N. C. • Cleveland, Ohio
Chicago, Ill. • Kalamazoo, Mich. • St. Louis, Mo. • Azusa, Calif. • Detroit, Mich.



IN SOUTH SAN FRANCISCO

Pumping costs are cut

BY DE LAVAL PUMPS WITH TIME CLOCK CONTROL

To assure the lowest possible operating costs, the California Water Service Co. has selected De Laval pumps for seventy-eight of its installations.

In the South San Francisco Station three of these pumps are operated by an automatic time clock system so designed that most of the pumping load is carried during the night at off peak power rates. A Bristol telemetering automatic control transmitter, located at the high level storage tank and connected over a leased telephone circuit, is tied in with a time clock control which operates one pump as required during the day: and one, two or three pumps at night.

The high sustained efficiency of De Laval Pumps keeps costs down year after year.

Atlanta • Boston • Charlotte
Chicago • Cleveland • Denver
Detroit • Helena • Houston
Kansas City • Washington, D.C.

DE LAVAL

Tulsa • Los Angeles • New York • New Orleans • Salt Lake City • Philadelphia • St. Paul Seattle • Pittsburgh • Rochester San Francisco • Winnipeg Toronto • Edmonton • Vancouver

DE LAVAL STEAM TURBINE COMPANY • TRENTON 2, N. J.

WW-3

TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS • CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS AND COMPRESSORS • IMO OIL PUMPS

(*Continued from page 8*)

The Third Inter-American Sanitary Engineering Conference is to be held on November 20–27, this year, at Santiago, Chile, under the sponsorship of the newly founded Inter-American Association of Sanitary Engineering working with the Chilean Institute of Engineers. Invited are all persons engaged in sanitation activities throughout the Western Hemisphere.

The recently formed Chilean Section of the association, in charge of conference details, has indicated that general plans include: inspection trips through Santiago's water and sewage works; a large list of technical papers on water supply, sewage treatment, malaria control and rural sanitation; manufacturer's exhibits; and some interesting sightseeing tours of the city. Under the head of business will be final action on the association's constitution jointly prepared and approved by the Rio and Caracas regional meetings last year and replacement of the Interim Committee by a permanent Board of Directors of 21 members.

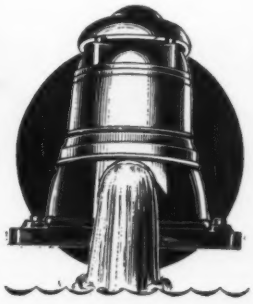
Information regarding the conference and the association are available from the Secretary, Inter-American Association of Sanitary Engineering, N.W. Corner, 17th & Constitution Ave., Washington 6, D.C.

(*Continued on page 12*)

CUT WATER COST

WITH A LAYNE HIGH EFFICIENCY WELL WATER SYSTEM

If water cost for your city seems to be excessive, be sure that it will continue to mount until you install more efficient equipment. Layne can convert your old wells and pumps and thus lower your water cost and perhaps give you an increase of many thousand gallons. The cost may be quite nominal. For further information, address LAYNE & BOWLER, INC., General Offices, Memphis 8, Tenn.



WRITE FOR LITERATURE

You may obtain late literature, bulletins, etc. at no cost or obligations. This fully illustrated material will be most helpful as aids in perfecting your water developing plan.

A SIZE FOR EVERY NEED

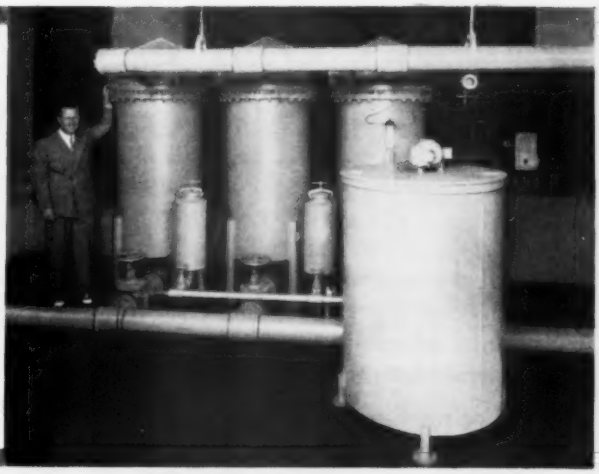
LAYNE

WELL WATER SYSTEMS • VERTICAL TURBINE PUMPS

HERE'S TO *Clear* WATER!

%Proportioneers% war-born Diatomaceous Earth Filter, now enlarged and perfected as the Pur-O-Cel Filter, marks a great advance in efficiency and compactness over the conventional Pressure Type sand filter. Small water treatment plants, swim pools and process industries can today have clear, brilliant water, completely free of turbidity. High filtration rates are safe and operation is simple . . . filtering becomes a purely mechanical operation, not a chemical process.

The **PUR-O-CEL** is a pressure type filter using thin mats of interlaced particles of diatomaceous earth instead of a sand bed. The filter is first precoated with diatomaceous earth and then is fed a body coat which keeps the filter porous and permits high filtration rates over long periods. Simple backwashing, without disassembling, quickly restores Pur-O-Cel to its original efficiency.



Bring your water clarification process up to date with this new method of filtering.

Write for Bulletin 1550.

% PROPORTIONEERS, INC. %

61 CODDING STREET, PROVIDENCE 1, R. I.

(*Continued from page 10*)

First come, first served is the basis on which one of the Corporate Members of the Association is disposing of a surplus stock of cast-iron pipe and fittings. Available for immediate delivery, subject of course to prior sale, the following items are beings offered for sale:

1. The following A.W.W.A. bell and spigot cast-iron pipe: 60 ft. of 60-in. Class B; 396 ft. of 42-in. Class B; and 70 ft. of 30-in. Class 150.
2. A large assortment of Class B and D fittings for the above sizes, as well as fittings for pipe down to nominal sizes of 18 in.
3. The following 150-psi. bell end, spur gear gate valves, with standard by-passes except as noted: three 6-in. (no by-pass); four 24-in.; one 42-in.; and one 48-in.

Inquiries concerning this equipment should be directed to the Purchasing Dept., Tennessee Eastman Corp., Kingsport, Tenn.

William F. Guyton, Hydraulic Engr. with the U. S. Geological Survey, has been transferred from Oxford, Miss., to Washington, D.C., where he has been assigned to the Ground Water Sec. of the Water Resources Branch.

(*Continued on page 14*)

TENNESSEE CORPORATION
Ferri-Floc
FERRIC SULPHATE

DEPENDABLE!
ECONOMICAL!

Ferri-Floc is a partially hydrated ferric-sulfate that gives lower operating cost. Ferri-Floc is readily soluble in coldest water, gives off no corrosive fumes in warmer water, making fans on solution pot entirely unnecessary. It does not pass through a gummy stage going into solution and can be stored in open bins for indefinite periods of time.

For further information of Ferri-Floc, the superior coagulant, that will lower your operating cost in the treatment of water, industrial waste, sewage, and sludge conditioning. Write the Tennessee Corporation, Grant Building, Atlanta 1, Georgia.

TENNESSEE TC CORPORATION
Atlanta, Georgia — Lockland, Ohio

Clow-National

CAST IRON PIPE AND FITTINGS

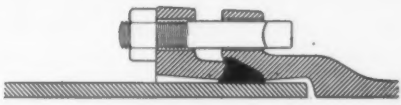
CAN BE FURNISHED TO MEET THE REQUIREMENTS OF ALL EXISTING SPECIFICATIONS

SUPER-deLAVAUD CENTRIFUGALLY CAST IRON PIPE

The standard water bell is the most common type of cast iron pipe joint—popularly known as the "bell and spigot" joint. Available in sizes 3 to 24 inches inclusive, in 12 and 18-foot lengths, and for working pressures up to 250 pounds.

Standard Water Bell

A time-saving, easily installed mechanical joint cast iron pipe now used extensively. Made in all sizes from 3 inches through 24 inches, in 18-foot lengths, and for pressures up to 250 pounds.



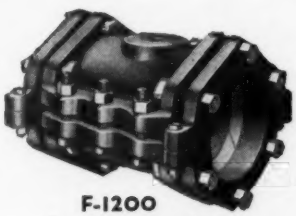
"C-N" Mechanical Joint

Cast iron flanged pipe is widely used for exposed pipe line work, inside and outside of buildings, for conducting water, steam, gas, oil and other fluids. Comes in same sizes and for same pressures as listed above, and in laying lengths, as ordered, up to 18-feet.

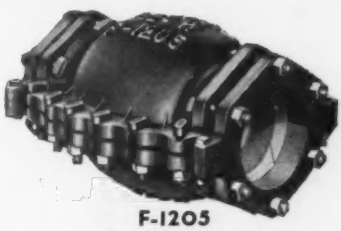
Flanged Joint

CLOW MECHANICAL JOINT SPLIT REPAIR SLEEVE

NO LEADING OR CALKING—ONLY A RATCHET WRENCH NEEDED



F-1200
For Repairing Breaks Through Pipe Barrel



F-1205
For Repairing Breaks Through Pipe Joints

It is better to have Clow Split Sleeves on hand and NOT need them than to NEED them and not have them.

JAMES B. CLOW & SONS

201-299 N. Talman Avenue (P. O. Box 6600 A) **CHICAGO 80, ILLINOIS**

NATIONAL CAST IRON PIPE DIVISION

of James B. Clow & Sons

P. O. Box 2542, BIRMINGHAM 2, ALA.

Everything for the municipal water supply system

(*Continued from page 12*)

War Assets Administration reported late in July that almost 70 per cent of the 27 billion dollars of war property declared surplus to that time had been liquidated. Expecting another 7 billion dollars in surplus property acquisitions, it was able to report its over-all job 55 per cent completed. In reviewing his first year of accomplishment as War Assets Administrator, Major General Robert M. Littlejohn presented a detailed picture of his problems, policies and plans, announcing that through sales during the year the government had realized a net return of 22 per cent of the cost of items sold, returning almost 2 billion dollars to the Treasury.

A study of this story of history's biggest merchandising business is breath-taking—the volume of sales, leases, scrapping, donation, transfers at discount and other methods of disposal almost fantastic. Disconcerting and irritating as have been some of the individual difficulties which many utility men have experienced, it is impossible to judge the over-all merits of such a tremendous undertaking on less than the final record of its successes and failures.

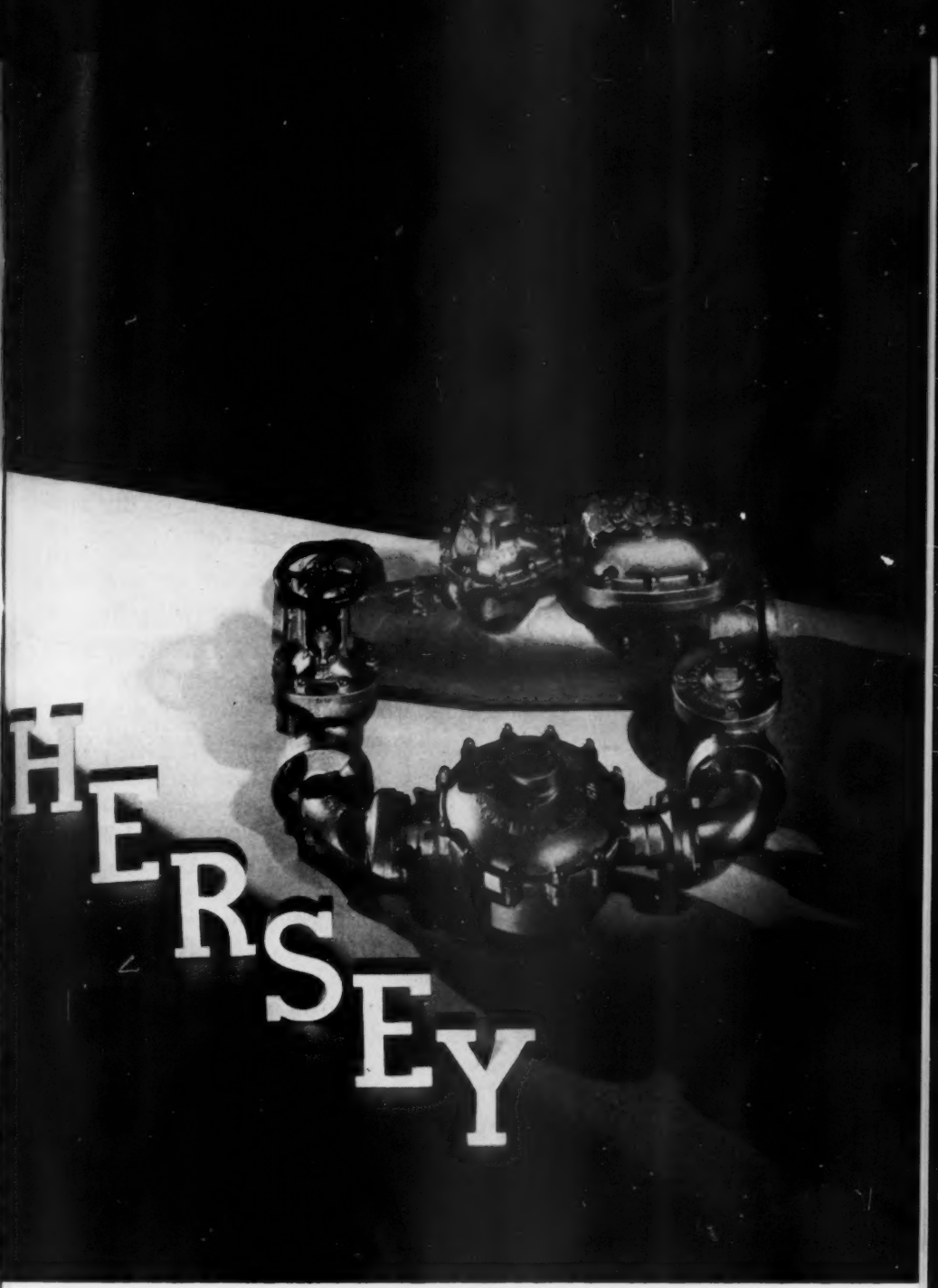
Financial Administration of Municipal Utilities is the title of a new book by Irving Tenner recently published by the Public Administration Service, Chicago. Discussing the principles underlying the financial administration of municipally owned water and electric plants, the author examines in detail such problems as fiscal policies, rate structures, budgeting, debt administration, customer accounts and purchasing. Offering a comprehensive survey of its subject, the book will be a valuable addition to the municipal water works library. It is available from the publisher's office at 1313 E. 60th St., Chicago, at a price of $3.75 per copy.

The Ohio Legislature recently passed two laws which will benefit water works men:

A strip coal mining act requires that every strip mine operator: (1) take out a yearly $50 permit; (2) make a bond or deposit of $100 for each acre to be mined in the coming year; (3) cover the exposed face of unmined coal with at least 3 ft. of overburden and seal off any break-through to underground workings; (4) level off all peaks and ridges of spoil banks to a minimum width of 15 ft.; (5) provide access roads and fire lanes; (6) within one year, plant trees, shrubs or grasses—or provide reservoirs or storage basins for water conservation—at a cost not in excess of $50 per acre and in accordance with plans prescribed by the Director of the Agricultural Experiment Station; and (7) make numerous reports.

An act relative to municipal officers attending conferences or conventions, authorizes employees "to attend, at the expense of the municipality, any conference or convention relating to municipal affairs," upon certification of the appropriate municipal official.

(*Continued on page 16*)



HERSEY DETECTOR METERS

have had the approval of water works engineers for more than thirty years, and are listed as standard by the Underwriters Laboratories, Inc.

HERSEY MANUFACTURING COMPANY

SOUTH BOSTON, MASS.

BRANCH OFFICES: NEW YORK — PORTLAND, ORE. — PHILADELPHIA — ATLANTA — DALLAS — CHICAGO
SAN FRANCISCO — LOS ANGELES

(*Continued from page 14*)

The Westchester Water Works Conference, Westchester County, N.Y., held its seventh annual meeting and outing July 17 at Schmidt's Farm, Greenburgh, N.Y., with an attendance of 166 water works officials and their guests. An afternoon of outdoor activities, was followed by a dinner and business meeting presided over by Chairman James C. Harding, Westchester County Public Works Comr. Elected to take office on January 1 were the following officers: *Chairman*—A. E. Kassay, Supt., Board of Water & Sewer Comrs., North Tarrytown; *Directors*—James C. Harding, William Foster, Supt., Peekskill Water Dept., and Walter G. Close, Port Chester Water Works; and, re-elected *Secy.-Treas.*—R. M. McLaughlin, Director, Div. of Sanitation, Westchester County Dept. of Health.

"Hawkins' Elixir," "Dipso's Delight" and "Table Rock Tonic" are all names suggested for the panacean product of the Greenville, S.C., City Water Works. Referring to Greenville's magnificent Table Rock water supply, John L. Hawkins, Supt., commented: "The Lord smiled on Greenville," when he received the following message from a former resident, since removed to Conneaut, Ohio:

> The city of Greenville's water is excellent for stomach ulcers and I need some for my wife. Will you advise me how I can get some shipped to me? Thanking you, yours truly, J. D. M———.

When Hawkins forwarded a clipping from the *Greenville News* recounting the incident, he suggested that "when you bottle it and sell it for medicinal purposes, you are operating a 'Grade A' Water Works." Although "Grade A" has a definite point, we are inclined to suggest "USP" instead. All of which reminds us that this should call for some comment by Dr. Wolman who discusses "Mass Medication" elsewhere in this issue.

D. F. Frick, San. Engr. of the South Carolina State Board of Health was recently transferred from the Div. of San. Eng. to the Hospital Div., where, as construction engineer, his duties will include the establishment of hospital sites, review of plans, inspection of construction and approval of all water supplies, sewage disposal and other sanitary items regarding the new program of hospital construction in the state.

(*Continued on page 20*)

GENUINE COOK WELL STRAINERS
REG. U. S. PAT. OFF.

A. D. COOK, INC.
Lawrenceburg • Indiana
Manufacturers of
Vertical Turbine Pumps, 10 to 10,000 gpm.
Well Strainers, 2 to 40 in.
Water Systems; Shallow Well, Deep Well and Ejector
Write for Sales Literature

DEEP WELL COOK PUMPS
REG. U. S. PAT. OFF.

IT MEETS THIS TEST

resulting in a product far superior to much of the cast iron pipe now in service underground. These standards, as well as the physical and metallurgical controls by which they are maintained, provide solid assurance that the cast iron pipe you lay today will live up to or exceed the long-life records of the oldtime product.

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

"SILENT SERVICE is not enough"—A.W.W.A.

The American Water Works Association is recommending to its members, for local action, a sound, well-planned program of Public Relations publicity and advertising. It is based on the premise that good water service, like good health, is too often taken for granted, in which case favorable public opinion is dormant.

To co-operate with this program and help to arouse national recognition of the efficient service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* readers of "Time" and "Nation's Business" throughout 1947.

For example, the following human-interest cartoon and excerpts from a current advertisement

a lot for a little

Lowest-priced item in the family budget, but so indispensable it would be cheap at any price, is *water*. You can still buy your 300 gallons per day (average family consumption) for less than a dime. Yet operating costs of public water supply systems, like living costs, have gone skyward. The fact that there has been no general increase in water rates throughout the country, despite higher costs, is a tribute to the efficient and economical operation of America's water supply systems.

The low cost of water is the more remarkable when you consider that it is collected, stored, processed, distributed and made available at the turn of a faucet or a fire hydrant.

Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 S. Michigan Avenue, Chicago 3, Ill.

SERVES FOR CENTURIES

(*Continued from page 16*)

Cross-connection consciousness has usually been a matter of "locking the barn door after the horse is stolen." In Seattle, however, the water department has not been content to await the theft. Based upon the indications of a preliminary investigation in 1944, the department trained inspectors and, early in 1945, initiated a systematic survey of governmental, industrial, commercial and waterfront establishments supplied through its distribution system. Since that time more than three thousand potentially dangerous cross-connections have been found, almost a thousand of them where the city supply was connected to the sewer system. To date some 75 per cent of the located connections have been severed by the owners of the property inspected, acting upon the recommendation of the department, no resort to legal proceedings to enforce compliance having been required. Although the department does not contemplate expanding the inspection to include private residences, it proposes to continue the current survey until it has eliminated all connections not only to sewers, sumps and process vats but to any water supplies not under the city's control.

Tenite tubing, a product of Tennessee Eastman Corp., Kingsport, Tenn., was the water pipe chosen for Boeing's new "Stratocruiser," the civilianized B-29, which will require a 435-ft. installation. Because of the wide differences in mineral contents of the waters available in the various parts of the world which the planes will visit, a plastic such as Tenite, which shows a negligible chemical reaction to all types of water, was preferred over metal. The fact that Tenite is one of the toughest plastics made, capable of withstanding the temperature extremes encountered in flying, and that it is both flexible and light in weight also made it especially desirable for such an application.

Joseph E. Jenkins recently resigned as Dist. San. Engr., State Dept. of Health, Fort Worth, Tex., to become associated with the Fort Worth consulting engineering firm of Joe Rady.

(*Continued on page 22*)

ZECO GREENSAND ZEOLITE

ZECO and HI–ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.

90 WEST STREET **NEW YORK 6, N. Y.**

"Badger took our water utility out of the 'red' and into the money column"

. . ."did this in a year's time," writes a mid-west city official. "We are still using Badger Meters...a very worthy product, honestly made, honestly priced, and we have found your company to be more than willing to help us with any water utility problem."

In over 5,000 communities, waterworks men know that "It pays to BUY BADGER."

BADGER METER MFG. CO.
MILWAUKEE 10, WIS.

BADGER Water METERS
ACCURACY · LOW COST MAINTENANCE · DURABILITY · DEPENDABILITY

BRANCH OFFICES:
NEW YORK CITY • PHILADELPHIA • WORCESTER, MASS.
SAVANNAH, GA. • CINCINNATI • CHICAGO • KANSAS CITY, MO.
WACO, TEX. • SALT LAKE CITY, UTAH • PORTLAND, ORE. • SEATTLE, WASH. • LOS ANGELES

(*Continued from page 20*)

William S. Lea, 1877–1947

William S. Lea, prominent Canadian consulting engineer, died suddenly on July 5 at his country home in Senneville, Quebec. Born in 1877, at Victoria, P.E.I., he was educated at Prince of Wales College and at McGill Univ., receiving his BS in 1908.

His engineering experience, both before and after graduation, extended over a period of 45 years. His advice was sought by municipalities in every province of Canada, as well as by provincial and dominion governments and industrial organizations, including many pulp and paper firms and power companies. He appeared as an expert before the International Joint Commission on questions of pollution of boundary waters, of water storage and of run-off control. He was responsible in large measure for design and construction of large-scale sewerage and sewage treatment schemes for Montreal, Winnipeg and Vancouver; for water supply systems or extensions in these cities and others; and for many hydroelectric developments.

Lea's early engineering experience was with two leading sanitary engineers in Boston, the late Freeman C. Coffin and the late Frank A. Barbour. While with Barbour, he was in charge of construction for the Fredericton Filter Plant, the first modern type filter unit in Canada, and operated the plant for six months. From 1908 to 1911 he lectured in municipal engineering and hydraulics at McGill Univ. In 1911–12 he was in charge of the Dept. of Water Works and Bridges for the city of Vancouver. In 1913 he joined his brother, the late R. S. Lea, in a consulting engineering partnership, continuing the joint practice until his brother retired in 1930.

Since that time, Lea has been retained by municipalities in every province of Canada and by a number of large corporations. He acted as technical expert for the city of Winnipeg and the Winnipeg Electric Railway Company on a number of occasions and for nine years was a member of the Montreal Sewers Commission and consulting engineer on its $20,00,000 trunk sewer construction program. At the time of his death he was retained by the city of Montreal on the design of a sewage pumping plant and was consultant to the city of Winnipeg for the design and construction of trunk sewers and a 25-mgd. sewage treatment plant, a $4,000,000 project.

A member of the A.W.W.A. since 1924, Lea also belonged to a number of other technical societies, and, as a member of the American Concrete Institute Committee, did important work on the specifications which brought reinforced concrete pipe into wide acceptance.

(*Continued on page 44*)

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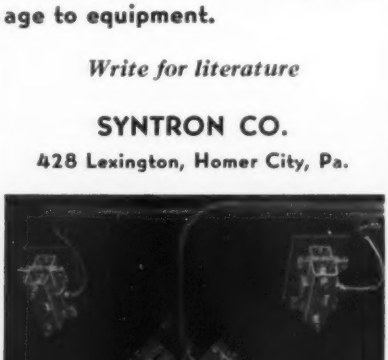

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Baker, Ronald D., Owner, Dayton Sofwater Co., 1288 McCook Ave., Dayton, Ohio (July '47)

Birmingham Water Works Co., The, Alfred O. Norris, Vice-Pres. & Gen. Mgr., 2114—1st Ave., N., Birmingham, Ala. (Corp. M. July '47)

Blanchard, Francis B., Sr. Hydr. Engr., East Bay Munic. Utility Dist., 512—16th St., Oakland 4, Calif. (July '47)

Bullock, Albert Ebb, Salesman, Southern Alkali Corp., 414 Tower Petroleum Bldg., Dallas, Tex. (July '47)

Canham, Robert B., San. Engr., U.S. Public Health Service Field Training Station, 927—1st Ave., Columbus, Ga. (July '47)

Carter, Harold S., Prof. of Civ. Eng., Univ. of Utah, Salt Lake City, Utah (July '47)

Causey, James Campbell, Jr., Civ. Engr., 502 National Bank Bldg., Suffolk, Va. (July '47)

Cobbs, Richard H., Mgr., Andalusia Elec. & Water Co., Andalusia, Ala. (July '47)

Coffield, Cecil C., Supt., Water Works & Sewers, City Bldg., Parkersburg, W.Va. (July '47)

(*Continued on page 30*)

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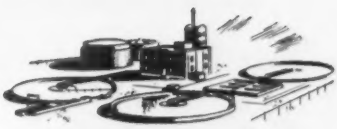

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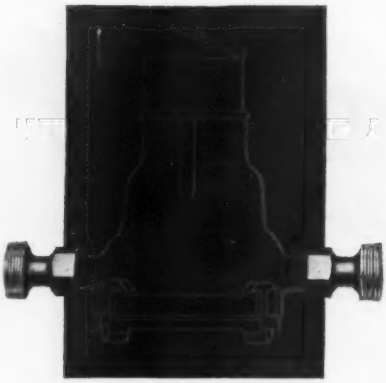

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Coulter, Thomas H., *see* Montrose Water Board

Cremens, J. W., Jr., Sales Repr., Johns-Manville Sales Corp., 1135 N. Academy St., Galesburg, Ill. (July '47)

Crutchfield, C. C., *see* League of Texas Municipalities

Daugherty, S. L., Supt., Water Works, West Liberty, W.Va. (Affil. July '47)

Dennis, Joseph M., Jr. Engr., Div. of San. Eng., State Dept. of Public Health, 420—6th Ave., N., Nashville, Tenn. (July '47)

Dodge, George S., *see* Montebello Land & Water Co.

Dougherty, John J., *see* Albert Pipe Supply Co., Inc.

Ellis, C. M., Vice-Pres., Jos. W. Eshelman & Co., Inc., 2625—6th Ave., S., Birmingham 5, Ala. (July '47)

Eshelman, Joseph W., Pres., Jos. W. Eshelman & Co., Inc., 2625—6th Ave., S., Birmingham 5, Ala. (July '47)

Evans, Charles H., Sales Mgr., Chicago Branch, Rensselaer Valve Co., 53 W. Jackson Blvd., Chicago, Ill. (July '47)

Ferguson, Wayne, Water Works Supt., Water Dept., 204 Steuben St., Horseheads, N.Y. (July '47)

Ford, George A., Pres., Fairfax Hydraulics, Inc., 1715 Lee Highway, Arlington, Va. (July '47)

Forristall, W. H., Mgr., Factory Insurance Assn., Eastern Regional Office, 555 Asylum St., Hartford 2, Conn. (July '47)

French, Frank H., Mgr., Factory Insurance Assn., Pacific Regional Office, 465 California St., San Francisco 4, Calif. (July '47)

Frommholz, Hans E., Civ. Engr., Crompound St., Peekskill, N.Y. (July '47)

Gaskill, Charles, Jr., Partner, Gaskill & Walton Construction Co., 17 S. Main St., Crete, Ill. (July '47)

Glancy, Blair J., Supt., South Montebello Irrigation Dist., 437 Bluff Rd., Montebello, Calif. (July '47)

Goldak Co., The, Fred P. Greenhalgh, Mgr., 1544 W. Glenoaks Blvd., Glendale 1, Calif. (Assoc. M. July '47)

Green, George W., *see* Panama Canal

Greenhalgh, Fred P., *see* Goldak Co., The

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Grider, H. L., Mgr., Factory Insurance Assn., Western Office, 175 W. Jackson Blvd., Chicago 4, Ill. (July '47)

Grippi, Vincent, Engr., Keis & Holroyd, c/o Crosby, 126—4th St., Troy, N.Y. (July '47)

Hatton, Bert, Salesman, Johns-Manville Corp., 777 Thomas St., Seattle, Wash. (July '47)

Hayford, Carl B., Pres., Village of Brookfield, 3706 Maple Ave., Brookfield, Ill. (July '47)

Heath, J. Ray, Pres., General Eng. Co., 725 Central Bldg., Seattle 4, Wash. (July '47)

Hennessy, John I., Mgr., Pub. Relations, East Bay Munic. Utility Dist., 512—16th St., Oakland 4, Calif. (July '47)

Herkenhoff, Gordon, Cons. Engr., Herkenhoff & Turney, Box 1122, Santa Fe, N.M. (July '47)

Hoag, Francis M., City Mgr., Manchester, Iowa (July '47)

Holmgren, Richard S., Asst. Chief Engr., San Diego County Water Authority, 314 Union Bldg., San Diego 1, Calif. (July '47)

Humphries, Albert G., Water Service Engr., Southern Pacific Co., 65 Market St., San Francisco, Calif. (July '47)

Kaufman, Warren J., San Engr., 1224 Davidson Ave., San Bernardino, Calif. (July '47)

King, Oren L., City Mgr., Pendleton, Ore. (July '47)

Kremer, Robert W., Prin. San. Engr., State Dept. of Health, 415—1st National Bank Bldg., Greensburg, Pa. (July '47)

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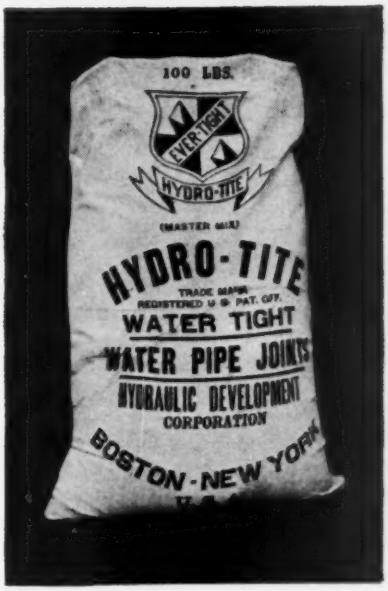

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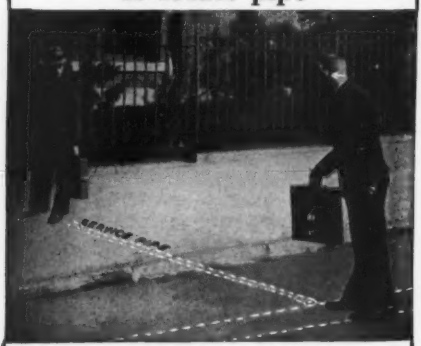

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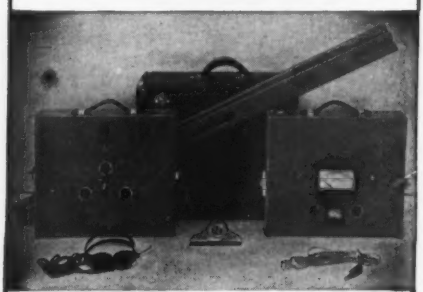

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Lahey, J. W., Town Engr., Dartmouth, N.S., Can. (July '47)

Lane, Carl D., Asst. Dept. Mgr., Shell Chemical Corp., Operation Dept., 1417 Greenwood Ave., Torrance, Calif. (July '47)

League of Texas Municipalities, C. C. Crutchfield, Field Consultant, 2220 Guadalupe St., Austin, Tex. (Corp. M. July '47)

Lewis, Lee S., Asst. Supt., Water Dept., 140 Franklin St., Mountain View, Calif. (July '47)

Lunt, Harold B., Accountant, Water Dept., 215 W. Broadway, Long Beach, Calif. (July '47)

Martin, H. E., Water & Sewer Dept., City Hall, Woodland, Calif. (July '47)

McCabe, Joseph, Asst. Prof., School of Eng., Manhattan College, New York 63, N.Y. (July '47)

McColl, O. J., *see* Smith-Douglass Co.

Merryman, Harold W., Asst. San. Engr., State Board of Health, 634 N.E. 60th Ave., Portland 13, Ore. (July '47)

Montebello Land & Water Co., George S. Dodge, Secy., 424 Whittier Blvd., Montebello, Calif. (Corp. M. July '47)

Montrose Water Board, Thomas H. Coulter, Chairman, Box 92, Montrose, N.Y. (Corp. M. July '47)

Myers, G. S., Sales Engr., Jos. W. Eshelman & Co., Inc., 2625—6th Ave., S., Birmingham 5, Ala. (July '47)

Myers, Howard H., Cashier, Davenport Water Co., 211 Bradly St., Davenport, Iowa (July '47)

Nau, Henry H., Utility Engr., Water Dept., 2831 W. Broadway, Corpus Christi, Tex. (July '47)

Norris, Alfred O., *see* Birmingham Water Works Co., The

Panama Canal, The, Munic. Eng. Div., George W. Green, Munic. Engr., Balboa Heights, C.Z. (Corp. M. July '47)

Parks, A. D., Sales Repr., Mueller Co., 2036 E. 7th St., Charlotte, N.C. (July '47)

Pearce, Sam B., Pipe Line Contractor, 4615—2nd Ave., Los Angeles 43, Calif. (July '47)

Porter, Harold E., Supt. of Utilities, Box 148, Montpelier, Ohio (July '47)

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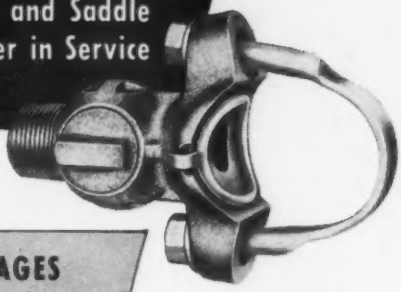

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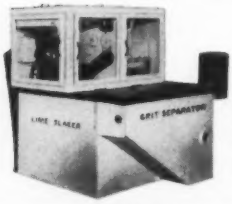

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Price, Robert W., Borough Mgr., 50 N. Spring St., Blairsville, Pa. (July '47)

Radford, City of, W. T. Wells, City Mgr., Radford, Va. (Corp. M. July '47)

Reese, Karl B., City Engr. & Water Supt., 211—2nd St., Hood River, Ore. (July '47)

Rooks, Ernest L., Supt., Water & Light, Plymouth, Ohio (July '47)

Rozlosnik, A., Mining Engr., Compania Exploradora Perforadora para Agua y Minerales, Sarmiento 459, Buenos Aires, Argentina (July '47)

Sargent, A. L., Exec. Director, Illinois Munic. League, 537 S. 4th St., Springfield, Ill. (July '47)

Seabrooke, T. R., Repr., James B. Clow & Son, Water Works Dept., 201 N. Talman Ave., Chicago 80, Ill. (July '47)

Simmer, H., & Co., Victor D. Simmer, 3948 N. Lowell Ave., Chicago 41, Ill. (Assoc. M. July '47)

Simmer, Victor D., *see* Simmer, H., & Co.

Smith-Douglass Co., O. J. McColl, Engr., Box 419, Norfolk 1, Va. (Corp. M. July '47)

Speer, Ralph E., City Engr., City Hall, Iron Mountain, Mich. (July '47)

Stanley, Donald R., Provincial San. Engr., Alberta Dept. of Health, Administration Bldg., Edmonton, Alta., Can. (Jan. '47)

Sturgeon, Myron A., Civ. Engr., 2115 Kimball Terrace, Norfolk, Va. (July '47)

Trees, George S., Contracting Engr., Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago 4, Ill. (July '47)

Wells, W. T., *see* Radford, City of

Zimmerman, Harry F., Partner, Patchen & Zimmerman, Daniel Field Airport, Augusta, Ga. (July '47)

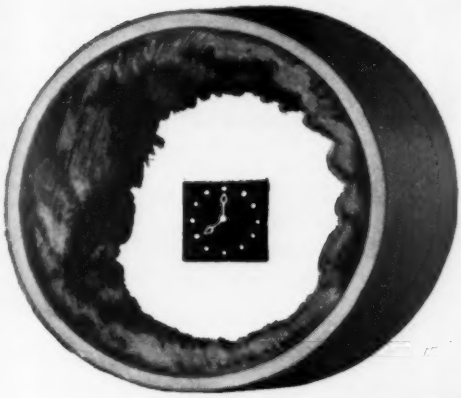
Zwick, John W., Asst. Water Service Engr., Southern Pacific Co., 65 Market St., San Francisco, Calif. (July '47)

REINSTATEMENTS

Anderson, S. T., Gen. Supt., Water, Light & Power Dept., City Hall, Springfield, Ill. (July '35)

Clark, Joseph R., Graduate School of Eng., Harvard Univ., Cambridge 38, Mass. (Apr. '44)

(*Continued on page 38*)



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Grantham, George R., Asst. Prof. of San. Eng., Dept. of Civ. Eng., Univ. of Florida, Gainesville, Fla. (Jan. '44) *P*

Julesburg, Town of, Joseph W. McNamara, Water Supt., Julesburg, Colo. (Corp. M. July '37)

McNamara, Joseph W., *see* Julesburg, Town of

Monroe, H. L., Supt., Water Works, Pontiac, Mich. (July '19)

LOSSES

Deaths

Hall, L. Standish, Prin. Hydr. Engr., East Bay Munic. Utility Dist., 512—16th St., Oakland 4, Calif. (July '33) *M*

Howland, Lee, 1863 Meadowbrook Rd., Altadena, Calif. (Jan. '41) *M*

Lovejoy, J. W., Gen. Supt., Comrs. of Public Works, Box 196, Laurens, S.C. (Apr. '30) *MP*

McCaslin, Walter R., Partner, McCaslin & Rachford, Engrs., 18½ S. Spruce St., Nokomis, Ill. (July '42) *P*

Meyerherm, Charles F., Pres. & Engr., Albert F. Ganz, Inc., 511—5th Ave., New York 17, N.Y. (Jan. '22) *M*

Russell, D. A., Chief Chemist, Youngstown Sheet & Tube Co., Youngstown 1, Ohio (May '24) *P*

Resignations

Sudlow, Harry, Aiken, S.C. (Apr. '30) *P*

Tait, Robert S., Asst. Supt., Water Dept., City Hall, Center St., Santa Cruz, Calif. (Oct. '25) *M*

Changes in Address

Changes received between July 5 and August 5, 1947

Boes, Robert J., Inst. of Textile Technology, Charlottesville, Va. (Oct. '42) *P*

Booker, Warren H., Maj., 913 Pecos Trail, Santa Fe, N.M. (Dec. '31) *P*

Chin, Tai, Chief Engr., Municipal Water Works Administration, 45 Kung Yuan St., Nanking, China (Apr. '46)

Domogalla, Bernard, 723 W. Johnson St., Madison 5, Wis. (Feb. '26) *P*

Elliot, Joseph E., Sr. Operating Engr., 612 Sherbourne Rd., Route No. 7, Richmond 24, Va. (Jan. '46)

(*Continued on page 40*)

1879—ROSS—1879

Automatic Valves

ALTITUDE VALVE

Controls elevation of water in tanks, basins and reservoirs

1. Single Acting
2. Double Acting

Maintains safe operating pressures for conduits, distribution and pump discharge

SURGE-RELIEF VALVE

REDUCING VALVE

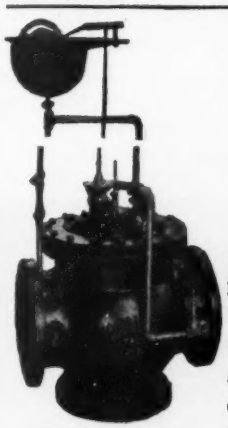
Maintains desired discharge pressure regardless of change in rate of flow

Regulates pressure in gravity and pump systems; between reservoirs and zones of different pressures, etc.

A self contained unit with three or more automatic controls

COMBINATION VALVE

Combination automatic control both directions through the valve.

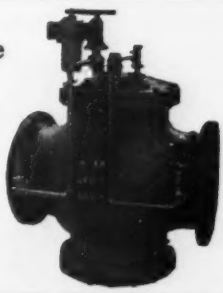


FLOAT VALVE

Maintains levels in tank, reservoir or basin

1. As direct acting
2. Pilot operated and with float traveling between two stops, for upper and lower limit of water elevation.

Electric remote control—solenoid or motor can be furnished



REMOTE CONTROL VALVE

Adapted for use as primary or secondary control on any of the hydraulically controlled or operated valves.

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3718 NORTHERN BLVD.
LONG ISLAND CITY 1, N.Y.

(*Continued from page 38*)

Fenkell, George H., 7716 Jefferson Ave., E., Detroit 14, Mich. (June '20) *Trustee '26–'28. Vice-Pres. '30. President '31. Director '31–'32, '38–'41. Honorary M. '40.*

Gearhart, J. N., Sitkum Route, Myrtle Point, Ore. (Jan. '41)

Griffin, Guy E., San. Engr., 13 Osee Pl., Cos Cob, Conn. (July '26)

Guillermety, Luis M., Jr., Box 4789, San Juan 24, Puerto Rico (Jan. '45)

Guyton, William F., Hydr. Engr., 10 Mississippi Ave., Silver Spring, Md. (Apr. '42)

Hamig, Louis L., Ferris & Hamig, Cons. Engrs., 1706 Olive St., St. Louis 3, Mo. (July '45)

Hanes, J. C., Div. of Health & Sanitation, Inst. of Inter-American Affairs, Casilla 13120, Santiago, Chile (July '39) *P*

Hastings, Warren W., Dist. Chemist, U.S. Geological Survey, 302 W. 15th St., Austin 14, Tex. (Jan. '43)

Heacox, Roland E., Civ. Engr., Barker & Wheeler, Engrs., Berne, N.Y. (July '46)

Hochlerner, Tobias, 820 West End Ave., New York, N.Y. (May '30)

Holden, E. G., San. Engr., 800 Eudora St., Denver, Colo. (Jan. '47)

John, Robert L., 37 Queen St., Spotz Bldg., York, Pa. (July '43) *P*

Kingston, S. P., Exec. Engr., St. Mary's Hospital, Rochester, Minn. (July '42)

Kinney, E. F., Sales Engr., Wallace & Tiernan Co., Inc., 230 E. Ohio St., Indianapolis, Ind. (Apr. '38)

Lee, William Boyd, Asst. Engr., East Bay Munic. Utility Dist., 512—16th St., Oakland 4, Calif. (Jan. '47)

(*Continued on page 42*)

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(Trade Mark Reg. U.S. Pat. Off.)
A Filter Medium for All Purposes

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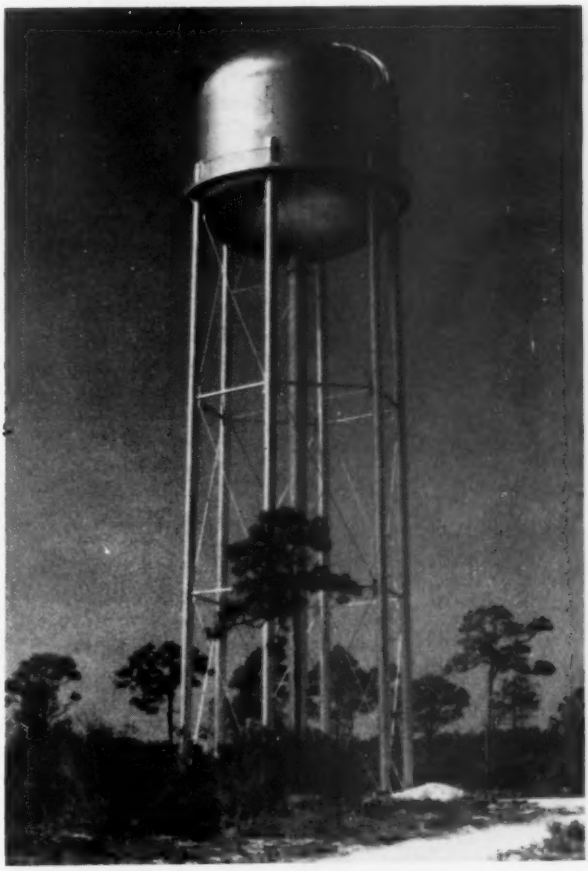

Welded Tank at Lake Worth

Lake Worth, Fla., has installed a 300,000-gal. elevated tank in the north end of its waterworks system to provide gravity pressure in that section of the city. It is an ellipsoidal-bottom structure of welded construction with cylindrical columns and an ellipsoidal roof. When planning waterworks improvements, write our nearest office for information or estimating figures on this modern design tank.

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The certificate will be delivered within 15 days of receipt of order, ready for you to frame and hang in your office.

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AMERICAN WATER WORKS ASSOCIATION

500 Fifth Ave., New York 18, N.Y.

(*Continued from page 40*)

Leland, Raymond I., San. Engr., 1436 W. Winona Ave., Chicago, Ill. (Jan. '39)

Lowe, Robert P., San. Engr., 3708 Millerton Ave., Pittsburgh 12, Pa. (Jan. '43)

Menzies, D. B., City Comr., Edmonton, Alta., Can. (Jan. '37)

Monte Vista County Water Dist., W. W. Coates, Supt., 275 S. Central, Ontario, Calif. (Corp. M. Jan. '47)

Morris, Kenneth L., Mgr., South Bay Cons. Water Co., Box 429, Patchogue, N.Y. (Oct. '45)

Oberly, H. T., Box 2842, St. Petersburg 1, Fla. (Oct. '39) *M*

Picton, Walter L., Div. of Health & Sanitation, Inst. of Inter-American Affairs, c/o American Embassy, Mexico City, Mexico (Apr. '43) *P*

Pimm, Alan B., Civ. Engr., 104 Jackson St., Tampa 2, Fla. (July '46)

Pomeroy, Richard, Cons. Chem. Engr., 40 W. Green St., Pasadena 2, Calif. (Oct. '43) *P*

Rihm, Alexander, Jr., 441 Kenwood Ave., Delmar, N.Y. (July '43)

Robinson, Joe L., Dist. San. Engr., State Dept. of Health, Box 1741, Fort Worth, Tex. (July '47)

Robinson, Milton C., 717 S. Carondelet St., Los Angeles 5, Calif. (Oct. '46)

Shearer, David H., 102—6th St., West Radford, Va. (Jan. '47)

Sparks, Harry H., Lock Box 356, Encinitas, Calif. (Sept. '31) *MP*

Staley, H. H., Partner, Staley & Maier, Cons. Engrs., 3226 Milburn, Houston 4, Tex. (July '38)

Walker, Walter E., 156 Mansion St., Poughkeepsie, N.Y. (Mar. '29) *MP*

Wannoni, Luis, Pres., Instituto de Obras Sanitarias, Caracas, Venz. (Jan. '47)

Waters, Leslie W., Asst. Civ. Engr., New York Board of Water Supply, 194 Pike St., Port Jervis, N.Y. (July '46)

Wells, C. C., Pres., Culligan Soft Water Service of Denver, 1800 S. Broadway, Denver 10, Colo. (Jan. '47)

Whiddon, Edwin L., Supt., Water Dept., Eagle Lake, Tex. (Oct. '46)

White, Lawrence S., Bacteriologist, Pub. Health Lab., R. C. Harris Filtration Plant, Queen St., E., & Nursewood Rd., Toronto, Ont., Can. (Jan. '43)

Wilson, Albert E., Jr., 933 Jamestown Crescent, Norfolk 8, Va. (Jan. '41) *P*

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(*Continued from page 22*)

Walter E. Walker had completed 36 years of service with the Poughkeepsie, N.Y., water works when he retired July 1 from his position as Chief Engineer. Oldest employee of the city in years of service, he left behind him a fine record of accomplishment, not only in the efficient operation of his department, but in supervising the various improvement projects which have enabled the Poughkeepsie system to keep pace both with growing demands and with the rapid progress in the field of water supply engineering.

Born in England and educated at the Leicester Inst. of Technology, Walker came to the U.S. in 1907 and immediately joined the service staff of the Worthington Pump Corp. of Harrison, N.J. Specializing in the installation of water works equipment, he became acquainted with the Poughkeepsie system in 1910, when he installed its steam pumping equipment. As a result of his contacts there, he was employed as Chief Engineer the following year and has served in that capacity ever since, through ten changes of city administration. His faithful and capable service was acclaimed at a testimonial dinner at which all the city's dignitaries and his co-workers over the years honored him.

(*Continued on page 46*)

DIFCO

Detection of Coli in Water

This group of Difco Dehydrated Culture Media is recommended for the detection and confirmation of the presence of coliform bacteria in water. Each medium is prepared to conform to all requirements of "Standard Methods of Water Analysis" of the A. P. H. A. and A. W. W. A.

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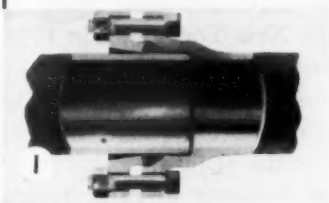
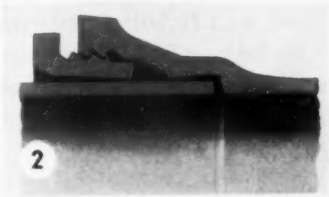
DIFCO LABORATORIES
DETROIT 1, MICHIGAN

THESE 5 JOINTS

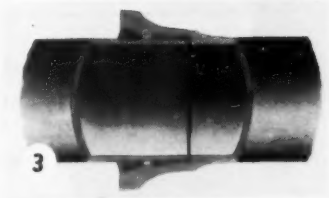
Supplied with Mono-Cast Centrifugal Pipe



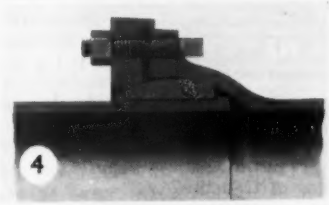
1. DOUBLEX SIMPLEX JOINT PIPE—A standardized mechanical joint pipe equipped with stuffing box type of joint having a ring gasket, cast iron gland, and cast iron bolts. Scientifically designed to meet the exacting requirements of low, medium and high-pressure service in handling gas and liquids.



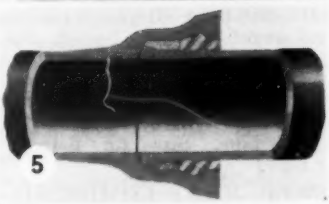
2. SCREW-GLAND JOINT PIPE—An all-purpose economical, mechanical joint pipe suitable for water, gas, oil and other fluids, developed in answer to the demand for a rubber-packed joint without bolts suitable for normal service and pressure conditions.



3. ROLL-ON-RUBBER RING JOINT PIPE—Designed as an alternate for bell and spigot pipe for conveyance of water, sewage or similar liquids. It is quickly and easily assembled by unskilled labor and after assembly the joint will easily deflect and remain tight under pressure.



4. MOLOX BALL AND SOCKET JOINT PIPE—An exclusive Acipco development, designed for river crossings and other installations requiring excessive joint deflection. It remains bottle tight under pressures up to several hundred pounds per square inch.



5. STANDARD BELL AND SPIGOT PIPE—Used under normal service conditions, the standard bell and spigot joint gives long and dependable service. It is supplied in diameters 3″ through 48″ inclusive.

AMERICAN CAST IRON PIPE COMPANY

Birmingham 2, Alabama

(*Continued from page 44*)

Dimitry S. Troubs, formerly director of Industrial Chemical Sales Div. operations at Covington, Va., was recently appointed co-ordinator of manufacturing operations of this entire division of West Virginia Pulp & Paper Co. In his new position, he will direct all chemical manufacturing operations in the company's six plants producing fifteen chemicals for industrial use.

Associated with the parent organization since 1924, Troubs was first engineer with the subsidiary Sonora Timber Co. of Nova Scotia. Assigned to the engineering department of the company's New York office in 1926, he served in that capacity until 1934 when he went to the Covington plant, serving as superintendent of the carbon plant until 1940, at which time he added to his duties supervision of tall oil manufacture. Finally in 1945 he assumed charge of all chemical operations at the plant.

A graduate of the Imperial Russian Naval Academy in 1912, Troubs came to America during World War I and served as a technical assistant in the U.S. Navy Bureau of Ordnance, after which he continued his studies at Harvard Univ. Engineering School and the Colorado School of Mines before joining the West Virginia Pulp & Paper Co. organization.

(*Continued on page 48*)

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Standard—"Traffic Model"—Flush Type—Water Crane Type

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Non-Rising Stem—Outside Screw and Yoke—Hub End—Flanged End—Ends to Fit Any Type Pipe

Also—Floor Stands, Shear Gates—Tapping Sleeves and Valves—Flap Valves—Mud Valves

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Tegul-MINERALEAD jointing compound for bell and spigot main. Ingot form. Stays correctly mixed. Impervious to moisture. Easy to work. Needs no skilled labor, caulking or deep bell holes. Less initial leakage permits prompt back filling of trenches.

The HYDE-RO Ring—Replaces packing in bell and spigot jointing. Speeds sterilization; saves water and hypochlorite. Facilitates repairs by giving dry joints. Works with *Tegul*-MINERALEAD, lead or Portland Cement—and on beaded or straight end pipe. Sizes for 4 to 12" diameter pipe.

G-K SEWER JOINT COMPOUND—the Original Bituminous compound for this purpose.

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SURE TO MEET YOUR SPECIFICATIONS FOR ACCURACY, LOW MAINTENANCE, LONG LIFE

Before you invest in water meters, get acquainted with the design and performance advantages which make Worthington-Gamon Watch Dog Water Meters first choice of so many municipalities and private water companies in the United States

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PUMP AND MACHINERY CORPORATION

(*Continued from page 46*)

James H. Chenery's recent resignation from the position of manager of the New York Water Service Corp. Merrick-Massapequa, N.Y., plant, set up a chain reaction within the associated South Bay Consolidated Water Co. plants last July. Taking the position Chenery has held since February 1941 was George E. Blackshaw, for ten years manager of the Patchogue plant of the South Bay organization. Moving into the Patchogue division was Kenneth L. Morris, manager of the Babylon plant since 1943. And at Babylon, H. G. Moore, formerly engaged in a staff capacity in the management of the various water supply properties in Nassau and Suffolk counties, becomes acting manager. Chenery, himself, left Long Island to accept a position with the Alabama Gas Co. at Birmingham.

G. E. Griffin, who recently joined the general engineering staff of the American Cyanamid Co. as Water Supply Engr., went to that job after almost six years of government service. During the war, from August 1941 until January 1946, he served with the Army Corps of Engineers, principally with the Service Command Engr. in Boston, but with eight months of duty in the Philippines assisting in the rehabilitation of the Manila water works. Following his Army service, he became Chief Engr. and Assoc. Chief of Party in Honduras for the Health & Sanitation Div. of the Inst. of Inter-American Affairs, remaining in that job until March of this year.

Charles F. Meyerherm, 1889–1947

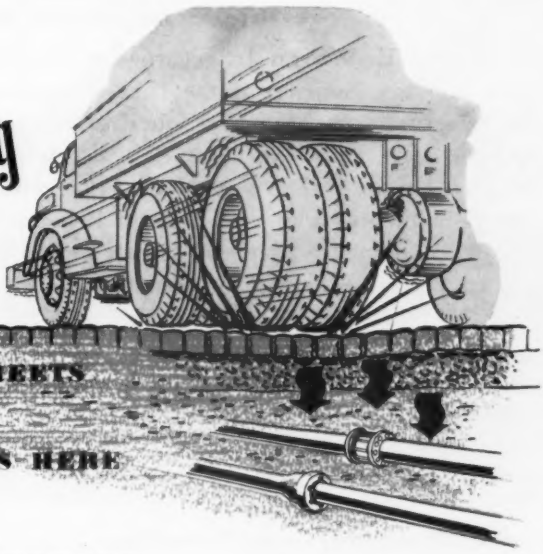
Following a brief illness, Charles F. Meyerherm, President & Chief Engineer of Albert F. Ganz, Inc., New York, died July 27 at the age of 58.

Born in Brooklyn, Meyerherm was educated at Stevens Institute of Technology, receiving a mechanical engineering degree in 1911. Four years later he joined the Ganz organization as chief engineer, in direct supervision of the various electrolysis and corrosion studies in which the firm specialized. Remaining with the organization for 32 years, he became a recognized authority in the field.

An Active Member of the Association since 1922, Meyerherm was able to serve the water works field through his numerous committee assignments. At the time of his death he was Secretary to the A.W.W.A. Committee 7N on Electrolysis and Electrical Interference, as well as serving as A.W.W.A. representative on the American Standards Association Committee C1, National Electrical Code, and the American Research Committee on Grounding.

(*Continued on page 50*)

Rumbling Trucks



...OVER CITY STREETS

...MEAN STRESSES HERE

DRESSER COUPLINGS
absorb harmful vibration . . . STAY TIGHT!

One of the common causes of leaks in pipes and joints under city streets is vibration set up by heavy and frequent traffic. Such pipe lines are seldom free from the pounding of heavy vehicles. Dresser Couplings, with their resilient gasket seal, "give and take" sufficiently to relieve pipe of such stresses and strains. In effect, a Dresser Coupling is a "shock absorber". This is a typical advantage of Dresser construction for urban pipe lines. Since 1880, Dresser has been accumulating a wealth of data on pipe joining methods which is available to help solve your problems today. Send us your inquiry; it will receive prompt attention.

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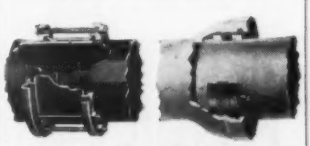

Style 38...for plain-end pipe

Style 85...for Bellmaster pipe

Style 38 Dresser Couplings and new Style 85 Bellmaster Joints are virtual "shock absorbers" . . . because they employ resilient gaskets under compression to seal pipe tightly. This is the key to years of reliable, trouble-free service under the most severe operating conditions, as in heavy traffic. Vibration, deflection and other pipe movements are permitted without leakage.

DRESSER COUPLINGS

(*Continued from page 48*)

Albert E. Wilson Jr. returned to Norfolk, Va., last July to become Sanitary Engineer at the U.S. Navy Amphibian Base. Previously he had served as a chemist with the Div. of Water Supply there from 1935 to 1941. In the interim years, he was Supt. of Filtration at Fredericksburg, Va., from 1941 to 1943; San. Engr. with the Corps of Engrs., U.S. Army, Baltimore, from 1943 through 1946; and had just completed a six-month assignment as a chemist with Penniman & Browne of Baltimore when he accepted his current position.

Gordon M. Fair, Dean of the Graduate School of Engineering, Harvard Univ. and member of the board of directors of Rockefeller Foundation is making a study of sanitary engineering research and education in Europe for the Foundation. His report will be used in planning the organization's future European engineering activities.

C. D. Adams, Cons. Engr., New Albany, Ind., has, since March 1, been working as chemical engineer for the Colgate-Palmolive Peet Co. at its Jeffersonville, Ind., plant. He is maintaining his connection with the water works field through the continuance of his consulting practice.

(*Continued on page 52*)

Prevent Rusting

Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.

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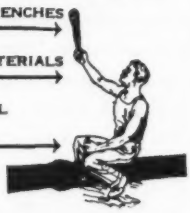
3 *Money, Time and Labor Saving Features of*

UNIVERSAL CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.



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3. ***Mercury dampening valve*** — essential in removing oscillations caused by line surges!
4. ***Mercury drain and filling plugs*** — for quick addition or removal of balancing liquid!
5. ***Air venting valves*** — for instant removal of air accumulations!
6. ***All-important equalizing valve*** — to enable checking and testing of instrument in place—at any time.

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for application with Venturi Tubes, Flow Nozzles, or Orifice Plates.

SIMPLEX VALVE & METER COMPANY
6784 UPLAND STREET, PHILADELPHIA 42, PA.

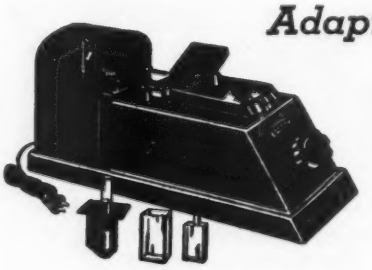
(*Continued from page 50*)

Armco Drainage & Metal Products, Inc., Middletown, Ohio, has announced the election of the following officers: President—S. R. Ives, formerly vice-president and general manager; Executive Vice-President—M. C. Patton, formerly vice-president and assistant general manager; and Vice-President in Charge of Sales—H. D. Neill, formerly assistant to the general manager. Ives and Patton were also elected to parallel positions in the Armco Drainage & Metal Products of Canada, Ltd. All have long records of service with the company in responsible positions, Ives since 1917 and Patton and Neill since 1926.

Smith-Blair Inc., South San Francisco, Calif., has announced a new self-adjusting, self-locking rubber ring packing for the pouring of wet or dry bell and spigot cast-iron pipe joints. Called the "Water-Lock Ring," the new device can be used with any joint compound and can be installed quickly without cutting or fitting. According to the manufacturer, this is the only sealing ring hydrostatically designed to increase its sealing action automatically from the pressure in the line, and will hold 40 to 60-psi. pressure without compound. Because the ring is non-porous, it cannot be a culture point for bacteria or other contaminating elements.

(*Continued on page 54*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER



Adaptable for Use in Water Analysis

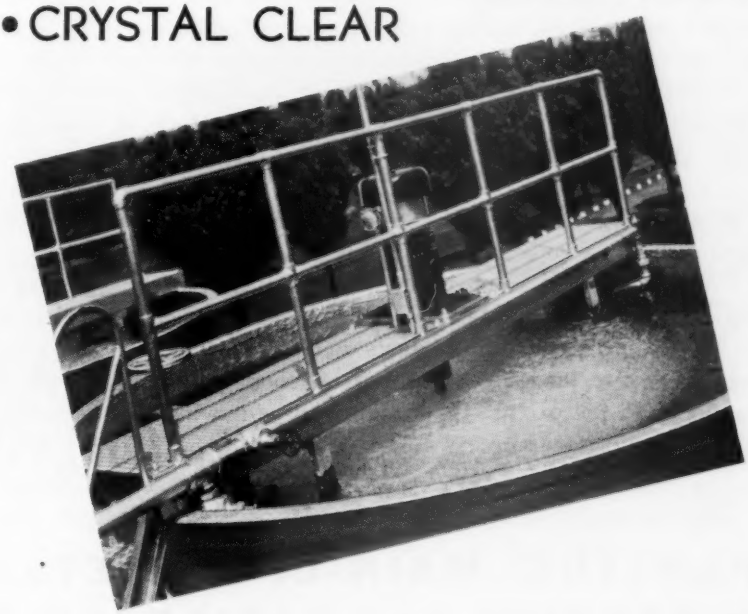
Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

KLETT MANUFACTURING CO.
179 EAST 87th STREET · NEW YORK, N. Y.

Ozonation MAKES WATER

• BETTER TASTING • SPRING-LIKE

• CRYSTAL CLEAR



Ozonation definitely reduces,—generally eliminates tastes and odors caused by industrial pollution, algae and decayed vegetation, thus producing water that is *better tasting, spring-like and crystal clear.*

Ozonation does this without leaving any taste or odor of its own, since ozone is active oxygen—nothing else. Ozonation also has the plus value of being a powerful germicide.

Improved palatability and chemical savings make ozonation economically practical. Write us for information.

WELSBACH

OZONE PROCESSES DIVISION

THE WELSBACH CORPORATION

1500 WALNUT ST. PHILADELPHIA 2

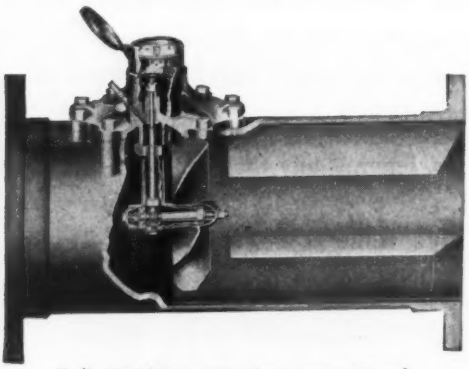
(*Continued from page 52*)

Solvay Sales Corp. has issued a new 100-page technical bulletin on the analysis of municipal and industrial waters. Designed to present methods suitable for rapid work without undue sacrifice of accuracy, the book contains sections on mineral analysis, stationary boiler water analysis, municipal and railroad water supplies, swimming pools and pollution. Information on reagents, indicators and standard solutions is included together with conversion tables and a list of atomic weights. Free copies may be obtained from the company's Advertising & Sales Promotion Dept., 40 Rector St., New York 6, N.Y., by requesting Tech. & Eng. Service Bulletin 11.

Wailes Dove-Hermiston Corp., Westfield, N.J., on July 1 ceased its operations as a separate corporation and became a department of the Tar Products Div. of Koppers Co., Inc., Pittsburgh. A Koppers' subsidiary since December 1945, the Wailes Dove organization will continue with the same personnel and products under the new set-up, the change in status having been made in the interest of economy and because the closer connection with the parent organization will permit increased emphasis on development and research.

(*Continued on page 56*)

SPARLING MAIN-LINE METERS for SERVICE and SATISFACTION

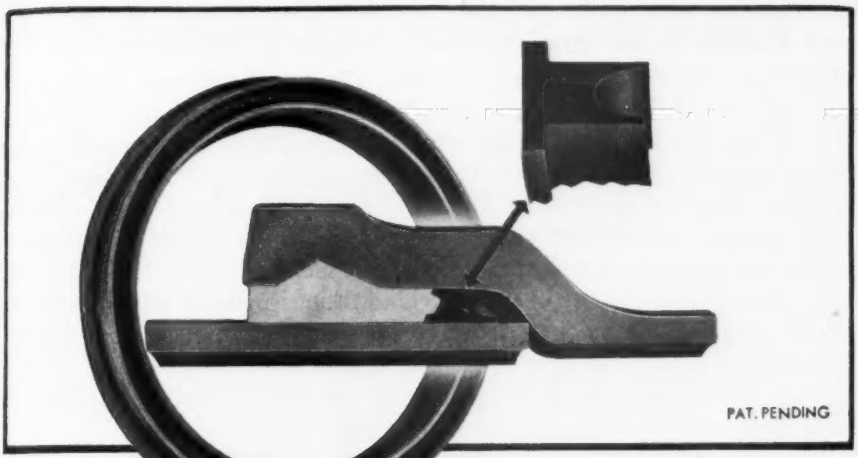


Bulletin 309 comes upon your request

FOR over 27 years the Sparling Meter has been giving thoroughly satisfactory service measuring flows—from pumps; into reservoirs, distribution lines and so on. Note the Direct Action—a propeller revolving with the flow is geared to a register reading in the desired unit! Each meter is a complete Totalizing unit, with Indicator, Recorder or Controls added as needed!

R. W. SPARLING *Manufacturer of* WATER MEASURING EQUIPMENT

LOS ANGELES 54...Box 3277 Terminal Annex
CHICAGO 16.....3104 South Michigan Ave.
622 Broadway.....CINCINNATI 2
101 Park Avenue .....NEW YORK 17
BOSTON 8.....6 Beacon Street



Improved RING PACKING... assures pouring of dry joints...

The Smith-Blair Water-Lock Ring does a real job of packing a bell and spigot cast-iron pipe joint! It is self-locking; it is self-adjusting to oversize bells; its sealing action automatically increases when pressure exists in the line. Made of molded rubber, it is non-porous and cannot be a culture-point for bacteria or any other contaminating element. It is installed quickly by simply rolling it back over the spigot. There is no cutting, fitting or chances for oversight; and its use actually saves on installation time. It is the only sealing ring hydrostatically designed to increase its sealing action automatically from pressure in the line. Effectively dams off water and assures pouring of dry joints.

Hydrostatically designed to hold 40-60 lb. pressure without compound.

Immediate Delivery!

SMITH-BLAIR WATER-LOCK RING PRICES					
Size	500 or more (each)	100-499	50-99	1-49	Approx. Shipping Wt. per 100 rings
4"	18¢	20¢	21¢	24¢	25 lbs.
6"	22¢	23¢	24¢	26¢	35 lbs.
8"	25¢	26¢	27¢	30¢	45 lbs.
10"	31¢	32¢	33¢	35¢	55 lbs.
12"	37¢	38¢	39¢	41¢	65 lbs.

Packed 50 rings to a carton. Broken cartons take the 1 to 49 price shown above. Quantity prices based on full cartons.

Used with any joint compound. Saves time. Makes a better joint.

Stocked in principal cities. Write for name of your nearest Smith-Blair Distributor.

SMITH BLAIR INC.
Water works supplies and specialties

SOUTH SAN FRANCISCO • CALIFORNIA

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

(*Continued from page 54*)

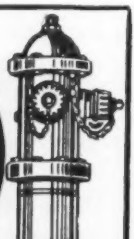
Ludlow Valve Mfg. Co., Inc., Troy, N.Y., has announced the election of Oliver F. Gang as President, Director & General Manager to succeed Alfred W. Thompson who became Chairman of the Executive Committee and continued in his office as Treasurer of the company. To accept the new positions as of July 1, Gang resigned his office as Vice-Pres. & Cons. Engr. of the William Powell Co., valve manufacturers of Cincinnati and New York. Prior to that job, he was sales engineer for another valve manufacturer, Lunkenheimer Co. of Cincinnati, from 1919 to 1931.

Gang was a member of the valve and fittings industry advisory to the WPB and the Marine Committee of the Manufacturers Standardization Society during World War II and served as Asst. Engr. Officer of the U.S.S. Mt. Vernon during World War I. He was formerly vice-president and director of the Valve Manufacturers Assn.

American Pipe & Construction Co., Los Angeles, has announced the opening of a New York office at 31 Nassau St. to provide an eastern sales and service outlet for its Amercoat Division. In charge of the new office will be William A. Guerry, who will be available for consultation on corrosion and contamination problems.

(*Continued on page 58*)

90 YEARS



We are in our ninetieth year of continuous operation. Every Kupferle Fire Hydrant is backed by incomparable manufacturing experience and knowledge.

JOHN C. KUPFERLE FOUNDRY CO.
ST. LOUIS

KUPFERLE

A.W.W.A.

Code of Practice

•

The A.W.W.A. Code, printed in two colors on a heavy 10 × 17-inch sheet, suitable for framing is now available for distribution to members.

For your copy, send only ten cents in coin or stamps to cover postage and handling charges. There is no charge for the document.

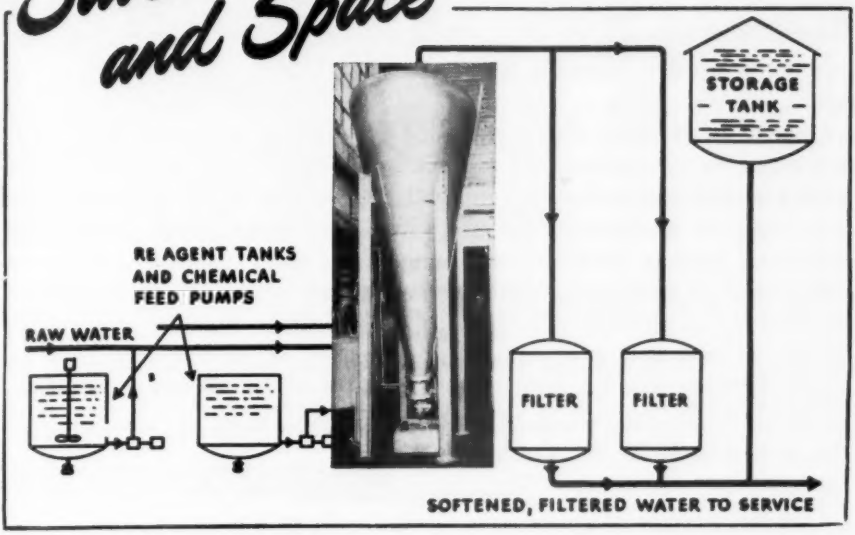
•

American Water Works Association

500 Fifth Ave., New York 18, N.Y.

NEW SLUDGELESS WATER SOFTENER...

Saves time and Space



Permutit* Spiractor applies established principles in a new way

Permutit's Spiractor—latest addition to modern cold lime or lime soda water treatment—operates on the principle of intimate contact with solid nuclei for accelerated precipitation. The conical container—itself a great saving in space over other type systems—is more than half filled with fine granules of calcium carbonate catalyst. Hard water and lime soda precipitant enter at bottom, mix at once, flow upward through catalyst bed. This tangential inflow gives a rising swirling motion that greatly speeds softening reaction by affording immediate contact between chemically treated water and suspended granules.

Precipitated hardness deposits on the surface of these granules which increase in size. There is no watery sludge; the enlarged granules are readily disposed of like moist sand grains. Detention period of the Spiractor is only five to ten minutes.

For more information write the Permutit Company, Dept. JA9, 330 West 42nd St., New York 18, N. Y. or Permutit Co, of Canada, Ltd., Montreal.

* Trademark Reg. U. S. Pat. Off.

PERMUTIT

WATER CONDITIONING HEADQUARTERS

(*Continued from page 56*)

Pittsburgh Equitable Meter Div., Rockwell Mfg. Co., Pittsburgh, has announced the return to volume production of its Imo meters. Shelved during the war because of the unavailability of high grade materials, the meter, which is manufactured under license from the Swedish Aktiebolaget Imo-Industri, has been improved in design to include a larger measuring chamber that will provide increased capacity and rotors of larger diameter to provide greater driving power at slower operating speeds.

Grove Regulator Co., Oakland, Calif., has announced a new product called the "Voidalator" to prevent back-flow in water systems. Comprised of two special check valves, with the body section of the first forming a void section between the two valves, and an automatic dump valve, the device permits automatic establishment and maintenance of a minimum differential regardless of pressures on either side of the manifold assembly. By shutting off tight prior to the start of return flow, the unit prevents any chance of back-flow contamination. Simplicity of design is claimed for both the "Voidalator" and the check valves employed, the latter embodying no metallic operating parts. Details are available from the company's office at 65th & Hollis St., Oakland 8, Calif.

(*Continued on page 60*)

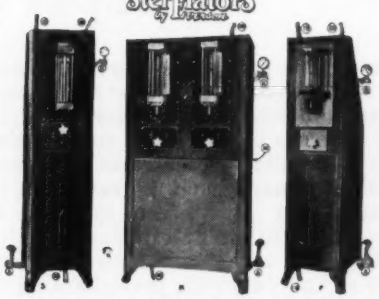
M H

HIGH QUALITY VALVES HYDRANTS

M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

FEEDS — METERS — MIXES CHLORINE GAS ACCURATELY

SterElators by Everson



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

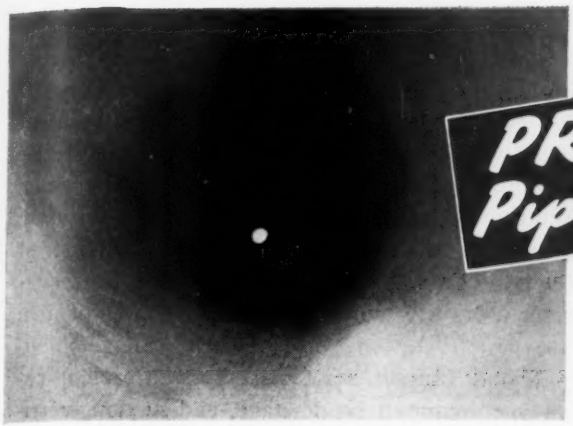
Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

SterElators by Everson

EVERSON MANUFACTURING CORPORATION
221 West Huron Street, Chicago 10, Illinois



Interior of a 48" rivetted steel water main with cement lining by Preload

PRELOAD Pipe Lining

HOW PIPE LINING CAN COST LESS THAN THE YEARLY INCREASE IN EARNING POWER IT MAKES POSSIBLE

If there is a ready market for additional water in your community, the increased earning power of your water main due to increased capacity made possible by PRELOAD Pipe Lining, can offset the cost of pipe lining.

To illustrate this point we have taken figures from an actual job. If the increased capacity of 38,000,000 gallons per day could all be sold at 5 cents per 1000 gallons, a not unreasonable assumption in this day of heavy water service demands and expanding industrial use, the results would be as follows:—

INCREASED CAPACITY

Combined capacity after cleaning & lining	83,000,000 G.P.D.
Combined capacity before cleaning & lining	45,000,000 G.P.D.
Increased Capacity	38,000,000 G.P.D.

POTENTIAL EARNING POWER

38,000,000 G.P.D. @ 5c per 1000 gallons	$ 1,900 per day
	or
Potential Increase in Earning Power	$ 700,000 per year
Entire Cost of Cleaning and Lining	$ 629,800
Surplus of 1 year's earning over cost	$ 70,200

CAPITAL SAVINGS

Estimated cost of new 48" pipe line	$2,362,050.00
Cost of Rehabilitation of existing line	$ 629,800.00
Capital Savings	$1,732,250.00

PRELOAD Cement Lining, utilizing tried and tested Preload Equipment, is at your service for conservation of your water main investment, possible increase in earning power, and increased flow capacity.

Send for our Pipe Lining Bulletin

THE PRELOAD COMPANIES

420 LEXINGTON AVE., NEW YORK, N. Y.

Designers and Builders of Prestressed Concrete Storage Tanks and Pressure Pipe
Prestressed Concrete Bridges and Cement Lining of Pipe in Place

The Preload Corporation
New York—Boston—Washington

Preload Central Corporation
St. Louis—Chicago—Kansas City

PRELOAD

Preload Pacific Corporation
San Francisco—Los Angeles

The Preload Co. of Canada, Ltd.
Montreal—Toronto—Halifax

(*Continued from page 58*)

Electric Fish Screen Co., Hollywood, Calif., has announced a new electronic generator developed jointly by the company's owner Henry T. Burkey and Westinghouse Electric Corp. Producing a special wave form of electric current, the generator is attached to screens of electrodes suspended in a stream or lake, to give approaching fish a series of mild shocks, which turns them away instantly. Used to steer millions of food fish safely past water intakes of irrigation canals, hydroelectric plants and industrial pumping installations, the device is a valuable asset to food fish conservationists as well as to the water users who wish to clear their supply of fish.

Peerless Pump Div., Food Machinery Corp., Los Angeles, recently introduced the "Fluodyne" pump, a single-stage, end-suction, vertically split case centrifugal type, to meet the need for an economical general utility pump with power drives from fractional to 20 hp. Capable of moving water in capacities up to 1,000 gpm. against heads up to 270 ft., the pump is being manufactured in two types: PE, an integrally coupled, compact electric unit in which pump and driving motor are anchored on the motor footing; and PB, a belt driven unit with the iron frame and bearing mounts supporting the various pump sizes integrally cast. The latter type is either keyed to a V or flat belt pulley, or direct connected to a standard horizontal electric motor by a pin type flexible coupling.

Among the advantages claimed for the new pump are that it may be installed and will operate in any position—vertical, horizontal or intermediate angle—and that the eight or more positions of the discharge opening (depending upon pump size) provide flexibility of installation. Full details may be obtained by requesting Bulletin B-165 from the manufacturer's office at 301 West Avenue 26, Los Angeles 31, Calif.

J. Carroll Kennedy, 1887–1947

J. Carroll Kennedy, Vice-President of the Kennedy Valve Mfg. Co., Elmira, N. Y., died June 23 following an operation at St. Joseph's Hospital, Elmira.

Born in Brooklyn in 1887, Kennedy attended Renssalaer Polytechnic Institute before joining the organization which his father founded. At the time of his death he had been vice-president in charge of manufacturing for twenty years.

In addition to his work within the organization, Kennedy had served the water works field as chairman of several committees of the Manufacturers' Standardization Society, and was at one time treasurer of the Industrial Management Association.

(*Continued on page 62*)

WF

Cast Iron Pipe

Manufactured in Sizes 2" to 96"—

Bell and Spigot Pipe **Special Castings**

Flanged Pipe **Flexible Joint Pipe**

Short Body B. & S. Specials

Warren Spun Centrifugally Cast Iron Pipe

Warren Foundry & Pipe Corp.

and

Warren Pipe Co. of Massachusetts, Inc.

Sales Offices
11 Broadway, New York 4, N. Y.
75 Federal St., Boston 10, Mass.

Works
Phillipsburg, N. J.
Everett, Mass.

(*Continued from page 60*)

Mathieson Alkali Works, Inc., New York, has just adopted a comprehensive employee insurance and benefit plan to cover all regular employees who have more than three months' service. Benefits to be provided at company expense include life insurance, nonoccupational accident and sickness payments, hospitalization and surgical benefits.

The life insurance coverage involved will be at the rate of $500 for employees of three months' to a year's service and $1,000 for those with more than a year, and is to be continued for employees past 65 whether on active or inactive service. Benefits between $15 and $60 per week, based on earnings, are to be paid for a maximum of thirteen weeks for any one nonoccupational accident or illness. A maximum of 31 days of hospitalization at $5 per day, special hospital services up to $25 and surgical benefits up to $75 are also included.

If a sufficient number of the employees participate, those with more than a year's service will be permitted to purchase additional life insurance coverage at the rate of 60 cents per month per thousand up to a maximum based on the individual's earnings bracket, with the company's contribution of the balance of the cost of each policy. Likewise it is proposed to allow extension of hospital benefits to include dependents at the employee's cost if a sufficient number with more than 3 months' service participate.

On Call . . .
to tell your story for you!

Willing Water wants work on or as your public relations staff. Let him be your spokesman to your customers . . . to your personnel. You'll find him a master of the art of putting across your ideas... of soliciting co-operation ... of establishing good will. Call him up... put him to work on your publicity, your signs, your bulletins, your bills, your reports... you'll find him ready, able and, of course, willing.

Low-cost blocked electrotypes or newspaper mats, in 32 different poses, are immediately available to you. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
500 Fifth Avenue • New York 18, New York

NEWS OF THE FIELD

The problem of nomenclature—human, that is—received rather plaintive treatment at the hands of the publishers of *Water Works Engineering* in their A.W.W.A. Convention Report issue. Contending that initials did not constitute satisfactory identification, they pointed out that a "mere initial" aborted many attempts at chumminess, and suggested the use of first name and middle initial.

In the complaint and the suggestion we concur—not so much because we want to call you Bill or Joe on first greeting, but because we want to be sure that you are William or Joseph rather than Walter or Justin, because we want to put you in the right place in the JOURNAL Index or the Membership Directory and to know at a glance which W. Smith or J. Jones you are. With the Association's roster growing rapidly, we run into more and more confusion on our own "Who's Who?" And if you're one of these unfortunate "S. S. Smiths," who was christened "Stinky Samuel Smith," we'll be glad to co-operate to the extent of "S. Samuel."

In one lazy particular, however, we want to register disagreement with the name-calling crusade. The above publishers have suggested the use of "Wm." and "Robt." in preference to "W." and "R." Preference, yes, but why give only clues and not the whole name? Is "Ed." to be interpreted "Edward," "Edgar," "Edwin," or just plain "Ed"? Why "Chas." or "Geo.," why "Jos." or "Jno.," when the addition of one or two letters will give you a readable, understandable, pronounceable name?

And while we're on the subject of names, we should digress far enough to plead for proper identification on correspondence. The sacrifice of legibility for individuality in signatures is understandable, but the evident desire of correspondents to hide behind that individuality in failing to give a legible translation of the signature somewhere on a letter is not—particularly if a reply is required.

Although modesty is a commendable trait, semi-anonymity is not necessarily one of its manifestations, and lacks the virtues of both identity and anonymity. *How's about it, Joseph?*

P.S.—*And you Josephine?* You rate a little berating too. There may have been good excuse for Miss Evans and Mme. Dudevant to hide their intrusive skirts behind the appellations George Eliot and George Sand, but since Susan B. (*never* S. B.) Anthony and the 19th Amendment made America safe for bloomerism, there has been no valid reason to secrete your

(Continued on page 2)

(*Continued from page 1*)

femininity behind "mere initials" and a masculine hand. And as long as there are still a few males in the business world, you owe them the opportunity to extend their gallantry to working hours.

Chivalry, like the horse from which the term derived, may be obsolete, but as long as there are men who like to bet on horses, there will be men who like to modulate their metaphors when addressing a lady. And even if you, yourself, don't believe in "that stuff," Josephine, you really ought to give a guy a chance, and, while you're at it, set him straight too as to your "Miss-" or "Mrs.-ness."

Abel Wolman said a while ago that one of the nation's greatest needs was a sort of superco-ordinating body in Washington to guide along consistent lines the federal agencies which deal with water resources. What he meant was, that with Congress subject to pressures from special interest groups who favored one or another development (such as power, flood control, irrigation, wild life and so on), no one has the time or the opportunity to look the problems over as a whole instead of piecemeal.

The special interest or pressure groups vary widely in their makeup and cut right across from leftish to right-wing ways of thinking. To some, water resources development means River Authorities, to others a happy hunting and fishing ground. Some want the western lands provided with new irrigation dams so that agriculture can be promoted. Others think of these western lands only as a place for cattle raising. When stream pollution is being considered, some think only of municipal sewage and disease germs, overlooking almost completely the far greater burdens with which the streams are loaded from soil erosion in agricultural areas or from the sludges and acid waters of mining areas.

Yes, we do need co-ordination—co-ordination of planning and action at federal and state levels. But most of all we need some objective and dispassionate thinking and understanding of the water resources problem by every intelligent citizen.

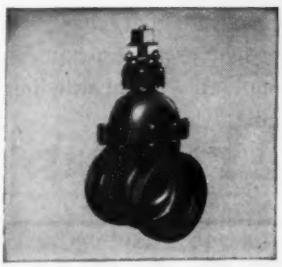
As a member of this Association, and as one who is credited by his fellow citizens as being informed about water, what have you done to put your own thoughts in order?

Construction requirements in water works and throughout the sanitation field are making news the world over. Returning from a four-week, 14,000-mile tour of Europe, Edward P. Schinman, Pres., Belco Industrial Equipment Div., Paterson, N.J., reported unprecedented activity in water works construction plans and projects involved in the rehabilitation of war-ravaged industrial and public water supplies. Conferring with government officials and industrial leaders in Sweden, Norway, Denmark, Holland, Belgium, Finland, Switzerland and Britain, he observed a keen interest in the

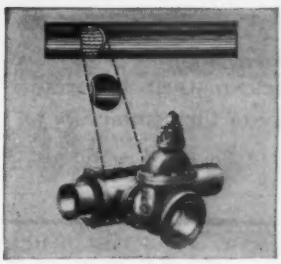
(*Continued on page 4*)

THE SMITH LAUREL LEAF

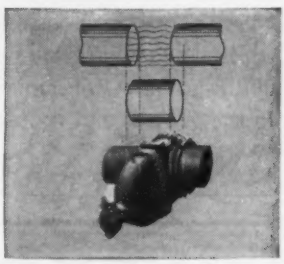
Fire Hydrants, **of the compression type featuring Protectop collision protection frost-proof tapered barrel, and positive action drain.**



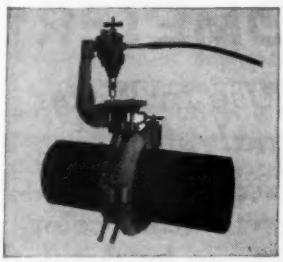
Gate Valves, **for low, medium or high pressure service. Manual, hydraulic cylinder, or motor operation.**



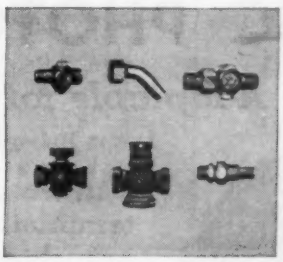
Tapping sleeves, **for making branch connections (in sizes 2" thru 42") under pressure in cast iron, steel, asbestos-cement or reinforced concrete pipe of any size.**



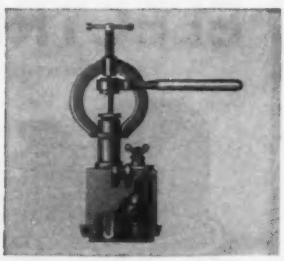
Inserting Valves, **for installing valves under pressure in cast iron, steel or asbestos-cement pipe in sizes 4" thru 48".**



Pipe Cutting Machines. **With the SMITH machine a true "lathe" cut can be made on cast iron, steel or asbestos-cement pipe in a minimum time.**



Water service brass goods: **corporation—curb cocks, couplings and other fittings for copper tube, lead and iron pipe services.**



Corporation Tapping Machines. **With the SMITH Tapping Machines corporation cocks can be installed under pressure. The machine is compact and easy to operate.**

**** Water works material of proven quality***

13

FIRE HYDRANTS
GATE VALVES
CHECK VALVES
INSERTING VALVES
TAPPING SLEEVES AND VALVES
WATER SERVICE BRASS GOODS

THE A. P. SMITH MFG. CO.

EAST ORANGE, NEW JERSEY

FLOOR STANDS
INDICATOR POSTS
TAPPING MACHINES
INSERTING MACHINES
FIRE CUTTING MACHINES

(*Continued from page 2*)

latest American methods of water treatment and purification as well as an enlightened attitude toward higher standards of water quality. Throughout there was a tremendous demand for American equipment.

And from the other side of the world, Col. Arthur B. Morrill, just returned from China after six years of service there, reported an awakening of interest in all sanitation facilities. Throughout China, despite the obstacles of high cost and lack of equipment, encouraging progress is being made, but before the minimum requirements can be satisfied almost fantastic amounts of equipment will be needed. And one of the most serious shortages appears to be the lack of sanitary engineers with broad experience in over-all planning of municipal work.

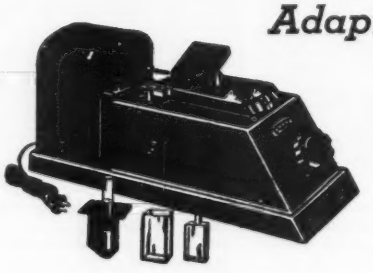
In South America, too, where field parties of the Office of Inter-American Affairs have been actively co-operating with the various government agencies, the demand is for more and more equipment and more and more construction.

The postwar construction boom is here, but more than that, there appears to be a new appreciation of the necessity for adequate sanitation facilities, a new consciousness of their importance—not only to health, but to the growth and industry of the community as well.

(*Continued on page 6*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

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and **HOW** *it's different*

The exclusive operating principle that sharply differentiates the ACCELATOR from other treatment equipment is a directed flow of slurry and "dynamic separation" of treated water from its surface.

Treated water separates and rises rapidly approximately at right angles to the surface of the dynamic lateral flow of slurry instead of percolating up through a sludge blanket. This means faster delivery of ACCELATOR treated water.

ACCELATOR installations regularly report a high quality of treated water.

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ACCELATOR
Advantages

Compact Unit

Low Cost

Simple Operation

Fast Reaction

High Rate

Automatic Sludge Removal

IF YOU WANT TO KNOW — ASK INFILCO

(*Continued from page 4*)

In Britain, too, shortages of materials are plaguing water works men trying to build and rebuild their systems and facilities. And to add to the unreasonable delays occasioned by labor and raw materials shortages, the utilities' position has been rendered more acute by the government's decision to give over-riding priority to industries concerned with the production of fuel and power. To date both the Inst. of Water Engineers and the British Water Works Assn. have been attempting to find some solution to the problem in consultation with the Minister of Health, but since the latter's allocation of materials has been substantially reduced by the government's action, he, too, has been unable to ameliorate the general state of shortages. Thus the water works continue on the same emergency status established during the war.

Poliomyelitis virus, at least 80 per cent pure, was recently isolated by Stanford University scientists Hubert S. Loring and C. E. Schwerdt in a project sponsored by the National Foundation for Infantile Paralysis. Seen through an electron microscope, the virus is a relatively spherical particle the diameter of which is estimated at 25 millimicrons. Chemically it reacts as a protein, which the two chemists believe it to be.

In announcing the opening of the experimental door to the discovery of a polio vaccine, Dr. Loring cautioned against any conclusion that success would necessarily follow such a search, indicating that a long and exacting experimental path lies ahead. But the work of the two scientists must be considered an important step forward in the all-out fight against the dread disease.

The Third Inter-American Sanitary Engineering Conference, originally scheduled for November 20–27, has been postponed until April 1948. Further information regarding the exact dates of the meeting to be held in Santiago, Chile, will be given in a later issue.

(*Continued on page 8*)

AMERICAN PIPE & CONSTRUCTION CO
CENTRILINE DIVISION
CEMENT MORTAR LINING OF WATER MAINS
SAN DIEGO · LOS ANGELES · OAKLAND · PORTLAND

CENTRILINE *cement-mortar lining of water mains . . . a service of*

American PIPE AND CONSTRUCTION CO.

in the Western States

When metal water mains lose efficiency, Centriline service by American may solve your problem. A rapid, economical method of reconditioning such pipe lines, the Centriline process is performed underground—in place. After cleaning the pipe, a thoroughly premixed cement-mortar lining of desired thickness is applied centrifugally without rebound. This dense, quality product is then mechanically trowelled to form a smooth, durable surface.

The Centriline process means distinct advantages to you, because it—

- Restores and maintains maximum hydraulic capacity.
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- Provides effective sustained service; offers a real economy in its application.
- Is accomplished rapidly, minimizing inconvenience to surface traffic.

The American Pipe and Construction Co. has enjoyed a wide experience in the field of water supply line engineering and construction over a long period of years and this experience and training are available to water works officials and engineers. Write for more detailed information concerning the remarkable Centriline Process.

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AMERICAN PIPE AND CONSTRUCTION CO.

Concrete Pipe for Main Water Supply Lines, Storm & Sanitary Sewers, Subaqueous Pipe Lines

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Quality pipe line products manufactured and installed by American include—
Lock Joint Concrete Cylinder Pipe · Prestressed Lock Joint Concrete Cylinder Pipe
American Concrete Cylinder Pipe · Centrifugal Concrete Pressure Pipe

(*Continued from page 6*)

Some popular Geological Survey reports, now out of print, are being considered for reprinting. In order to provide some basis for estimating the number that will be required, the Superintendent of Documents has asked interested parties to forward estimates of their own needs. Included in the list are the following water supply papers:

No. 489—MEINZER, O. E. The Occurrence of Ground Water in the United States. 321 pp., 31 pls., price 60¢

No. 494—MEINZER, O. E. Outline of Ground Water Hydrology, With Definitions. 71 pp., price 15¢

No. 577—MEINZER, O. E. Plants as Indicators of Ground Water. 95 pp., 12 pls., price 25¢

No. 638-C—MEINZER, O. E. Outline of Methods for Estimating Ground Water Supplies. 46 pp., price 10¢

The prices for reprints will necessarily be moderately higher than the original prices listed above because of the prevailing higher printing costs.

Water works men interested in obtaining copies of any of these papers are requested to write directly to the Superintendent of Documents, Government Printing Office, Washington 25, D.C., giving an estimate of their requirements. Such an estimate will not be considered an order.

(*Continued on page 10*)

LaMOTTE CHLORINE CONTROL UNITS

A series of units developed for the control of chlorine dosage in the treatment of water for municipal supply, swimming pool, condensing, cooling, sewage and a host of industrial uses. This equipment embodies the results of the latest developments in the use of the o-Tolidine Method for the determination of active chlorine.

LaMotte Chlorine Comparators

Standard Model, range 0.1–1.0 ppm.	$12.50
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Prices f.o.b. Towson, Md.

LaMotte Chlorine Comparator
(Roulette Type) Range 0.1–10.0 ppm.
A convenient laboratory installation by which readings can be made under uniform light conditions day or night.
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If you do not have the LaMotte A B C of pH Control, a complimentary copy will be sent upon request without obligation

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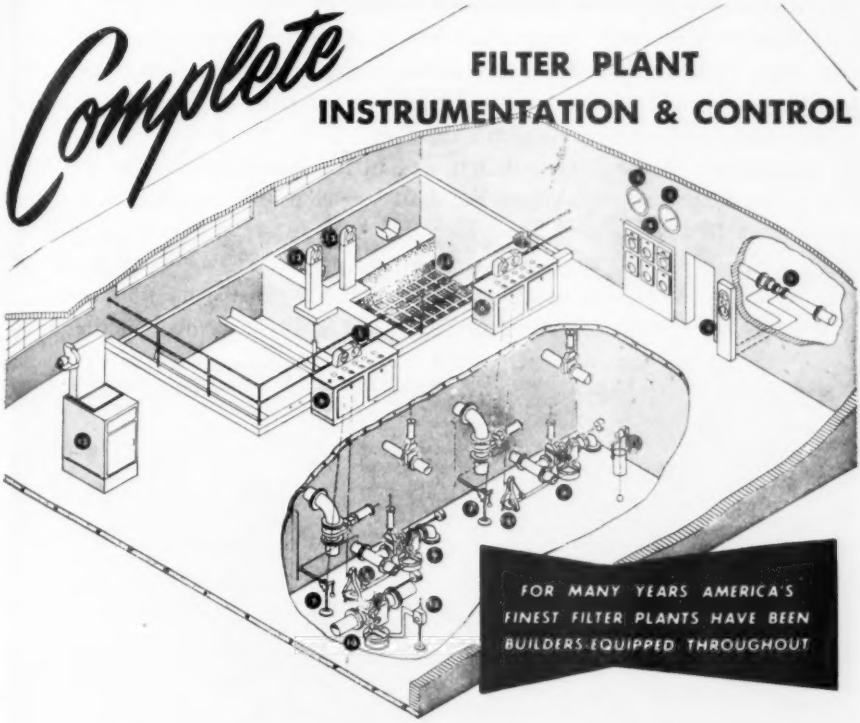
Complete FILTER PLANT INSTRUMENTATION & CONTROL



Every Unit of Builders Water Works equipment shown here is specifically designed to perform its own highly specialized duty — to give accurate, long-lived, trouble-free performance in your new or modernized plant. These qualities, plus many time-saving features, are the result of nearly a half-century's laboratory research, guided by the practical experience of hundreds of water works operators and engineers.

1. Herschel Standard Venturi Tube for Raw or Filtered Water.
2. Type M Register-Indicator-Recorder.
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4. Central Control panel with main line meters, water level Telemeters for remote tanks and reservoirs, etc.
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7. Diaphragm Pendulum Unit for Loss of Head.
8. Diaphragm Pendulum Unit for Rate of Flow.
9. Venturi Filter Effluent Rate Controller.
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12. Chronoflo Transmitter for Wash Water Gauge.
13. Sand Expansion Gauge.
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15. Omega Gravimetric Dry Chemical Feeder and Dust Remover . . . automatic proportional control from Raw Water Meter.

For Bulletins on these and other Builders products,
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BUILDERS PROVIDENCE
Instruments

(*Continued from page 8*)

Murder will out! That's the key to a rather amazing story from Div. Mgr. Ross E. Thompson of the Public Service Co. of New Mexico in Las Vegas. And Exhibit A in the case of the company against perpetrators unknown is the pipe section pictured below.

Discovery of the *corpus delicti* was in the best traditions of a *Philo Vance* mystery thriller. When the Las Vegas utility installed a booster pump on a 10-in. cast-iron line which had been in service on gravity flow since 1881, increasing the pressure from 42 psi. to 65 psi. maximum, the section shown in the illustration abruptly failed. Discovery and removal of the leaking unit proceeded according to the utility's normal maintenance

routine, but when workmen saw the underside of the pipe, they issued a hurry-up call for Sleuth Thompson to view the clues.

Working from such evidence as the piece of wire extending through the crack in the pipe (see photo), the fact that a small quantity of lead covered the crack for about a distance of 2 ft. *inside* the pipe, the fact that the crack was on the *exact* bottom of the pipeline, and from the utility records, Thompson deduced that the section had been cracked before installation and that the installers had successfully hidden the defect for 66 years by pouring some lead into the split and placing the defective surface at the bottom. Since neither the records nor the evidence at hand "put the finger on" the culprits, no manhunt has followed the detectivity. Undoubtedly some

(*Continued on page 12*)

WF

Cast Iron Pipe

Manufactured in Sizes 2" to 96"—

Bell and Spigot Pipe **Special Castings**

Flanged Pipe **Flexible Joint Pipe**

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Everett, Mass.

(*Continued from page 10*)

Statute of Limitations or Code of Clever Concealment would prevent their apprehension at this late date anyway. And the story itself is worth the price of a new piece of pipe.

Had it not been for the increase of pressure, there is no telling how long the cover-up job would have lasted. When the pipe was removed, lead did not adhere to the pipe wall, but there seems little question but that it must have broken lose during removal operations. At any rate, this is one wound that Time did not heal.

The American Chemical Society has now completed its appointments to its advisory Committee on Standard Methods for the Examination of Water and Sewage. Joining Chairman Edward S. Hopkins, whose appointment was announced previously, are: R. C. Bardwell, Supt. of Water Supply, Chesapeake & Ohio Railroad Co., Richmond, Va.; Floyd W. Mohlman, Chief Chemist, Chicago San. Dist., Chicago; C. C. Ruchhoft, Div. of San. Eng., Water & Sanitation Investigations, U.S. Public Health Service, Cincinnati, Ohio; and S. Kenneth Love, Chemist, Water Resources Branch, U.S. Geological Survey, Washington, D.C.

(*Continued on page 14*)

COMPARE IN SERVICE . . .
The Ford Tandem Resetter greatly simplifies meter checking by making it possible to connect two meters in series where one is regularly set. Convinces skeptical customers—shows up lazy meters. Three models—all easily installed in a few moments.
FREE CATALOG—Send for the free Ford Catalog. It describes Tandem Resetters and other Ford products for water utilities. Send for your copy today.
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RESETTERS

72 lbs. "SMALLER"

GRINNELL SOCKET FITTINGS

are easier to handle . . . cut installation time

● The 72 lb. weight advantage of this 8" Tee is typical of the space and time saving advantages of Grinnell's compact design in its complete line of socket fittings. See table for comparable sizes and weights of other popular sizes of Tees.

Socket and spigot dimensions and wall thickness are the same as AWWA Standard Class D pipe. Friction loss is not increased. Underwriters' Laboratories approved.

Write for catalog: "Water Works Specialties". Grinnell Company, Inc., Providence 1, Rhode Island. Branch Warehouses in Principal Cities.

TEE

	Grinnell		Competition	
	WEIGHT	RUN FROM BELL TO BELL	WEIGHT	RUN FROM BELL TO BELL
4"	96 lbs.	11 in.	128 lbs.	22 in.
6"	147 lbs.	13½ in.	200 lbs.	24 in.
8"	222 lbs.	16 in.	294 lbs.	26 in.
10"	325 lbs.	19 in.	395 lbs.	28 in.
12"	417 lbs.	21½ in.	512 lbs.	30 in.

GRINNELL

FOUNDED 1850

WHENEVER **PIPING** IS INVOLVED

(*Continued from page 12*)

Speaking of inflation, as who ain't these days, everybody—not *has,* but—*is* a good example of it himself, according to a recent report by Professor Nick Dallas of the Northwestern University chemistry department. The chemicals of the human body, which used to be valued at 98 cents, have skyrocketed to a retail value of $31.04—an increase of more than 3,000 per cent. Our 3.8 lb. of calcium phosphate, for instance, of little value not too long ago, could now be marketed at $5 per pound; and so on down the list, with *one* impressive exception: *"Only the price of water has remained stationary,"* said Professor Dallas. All of which is undoubtedly a more uncomfortable than interesting fact to the water works executive who is attempting to make ends meet.

Well weaned was the Cadillac, Mich., water utility, which celebrated its first anniversary on August 1. In forwarding a copy of his report of the first eleven months of municipal operation, Everett G. Reiser, Mgr., Board of Public Works, called to our attention the fact that the new utility's Check No. 1 was issued to A.W.W.A. for membership dues. Which made the Association a godfather, if not a midwife. What better way to begin business on a sound foundation!

(*Continued on page 16*)

How to join *more* bell and spigot cast iron water mains *per hour* ...*at less cost*

ELIMINATE USE OF HIGH PRICED LEAD

Haymanite JOINTING COMPOUND

Each lb. of Haymanite equals 4 lbs. of lead'... reduces time, fuel and handling ... eliminates caulking and large bell holes ... simple to apply ... self-sealing when broken.

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Producers also of M. H. Brand Caulking Lead

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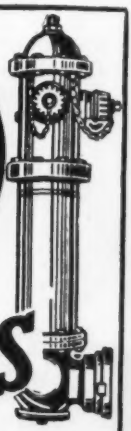

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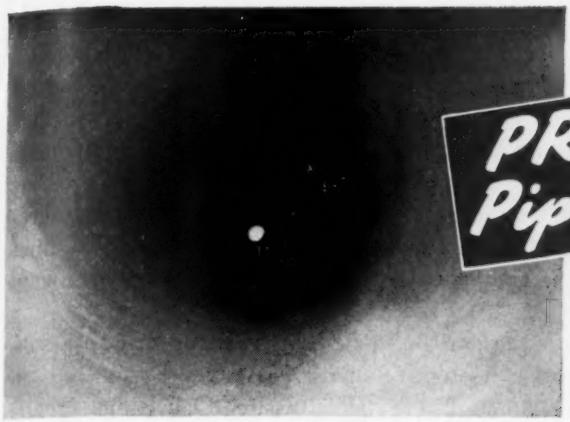

Interior of a 48" riveted steel water main with cement lining by Preload

PRELOAD Pipe Lining

HOW PIPE LINING CAN COST LESS THAN THE YEARLY INCREASE IN EARNING POWER IT MAKES POSSIBLE

If there is a ready market for additional water in your community, the increased earning power of your water main due to increased capacity made possible by PRELOAD Pipe Lining, can offset the cost of pipe lining.

To illustrate this point we have taken figures from an actual job. If the increased capacity of 38,000,000 gallons per day could all be sold at 5 cents per 1000 gallons, a not unreasonable assumption in this day of heavy water service demands and expanding industrial use, the results would be as follows:—

INCREASED CAPACITY

Combined capacity after cleaning & lining	83,000,000 G.P.D.
Combined capacity before cleaning & lining	45,000,000 G.P.D.
Increased Capacity	38,000,000 G.P.D.

POTENTIAL EARNING POWER

38,000,000 G.P.D. @ 5c per 1000 gallons	$ 1,900 per day
	or
Potential Increase in Earning Power	$ 700,000 per year
Entire Cost of Cleaning and Lining	$ 629,800
Surplus of 1 year's earning over cost	$ 70,200

CAPITAL SAVINGS

Estimated cost of new 48" pipe line	$2,362,050.00
Cost of Rehabilitation of existing line	$ 629,800.00
Capital Savings	$1,732,250.00

PRELOAD Cement Lining, utilizing tried and tested Preload Equipment, is at your service for conservation of your water main investment, possible increase in earning power, and increased flow capacity.

Send for our Pipe Lining Bulletin

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Designers and Builders of Prestressed Concrete Storage Tanks and Pressure Pipe
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Preload Pacific Corporation
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The Preload Co. of Canada, Ltd.
Montreal—Toronto—Halifax

(*Continued from page 14*)

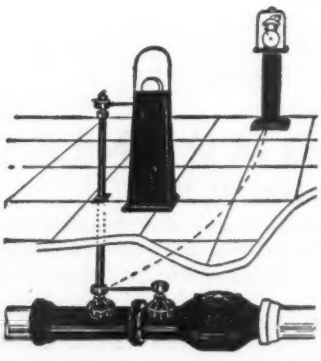
Enriched flour, bread, cereal, milk and a hundred other foods have bred a generation of *enriched* tastes, if impoverished pocketbooks. And now we note that *enriched water* is for sale. The U.S. Atomic Energy Commission has offered a small quantity of O^{18} enriched water for sale to qualified users at rates which will further deflate the unenriched water superintendent: 50 cents per gram for the first 100 grams; 30 cents per gram thereafter; to both of which will be added postage charges. Anyway, we doubt that will constitute serious competition for the distributors of just plain *eau*.

Serious application for the enriched product should be made by submitting a completed "Stable Isotope Request," AEC Form 100, in quadruplicate, to the U.S. Atomic Energy Commission, Oak Ridge, Tenn., Att: Isotopes Branch.

B. A. Poole, Director, Bureau of Environmental Sanitation, Indiana State Board of Health, whose powers of prediction won him half of the A.W.W.A. Board of Directors pool on conference attendance estimates, has reinvested his profits in another game of chance—a new fishing reel. No report has yet been received from George E. Ferguson, Dist. Engr., U.S. Geological Survey, Ocala, Fla., co-clairvoyant. An improved water grinder perhaps?

Indiana's District Water Works Meetings, an annual event sponsored by the State Board of Health, the A.W.W.A. Indiana Section and Purdue Univ., will feature discussions on construction costs, elevated tank maintenance and other subjects, and the stimulating Question Box session, it was announced by B. A. Poole, Director of the Board of Health's Div. of San. Eng. Meetings will be held at Valparaiso Sept. 24, Fort Wayne Sept. 25, Greendale Sept. 30, Crane Naval Ammunition Depot Oct. 1, and Greencastle Oct. 2.

(*Continued on page 18*)



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It's common knowledge that everyone, in consideration of his general good health, should drink several glasses of water a day. This rule is easier to follow when water is better tasting, spring-like and crystal clear—made that way by Ozone. Obnoxious tastes and odors caused by industrial pollution, algae and decayed vegetation are definitely reduced, often completely eliminated by Ozonation. In addition, Ozone is a powerful germicide—destroys pathogenic bacteria.

The net cost of Ozonation is surprisingly low in view of the great improvements it achieves and the chemicals it saves. Write us for Bulletin No. 105 "Ozone for Water Purification."

OZONE PROCESSES DIVISION

THE WELSBACH CORPORATION

1500 WALNUT ST. PHILADELPHIA 2

(*Continued from page 16*)

Charles J. Bruce, 1879–1947

Charles J. Bruce, for 18 years Superintendent of the Evitts Creek Water Co. supplying Cumberland, Md., and for many of his 68 years a respected authority on water supply, died on August 10. A Canadian by birth, Mr. Bruce was educated at Dalhousie College, N.S., and began his career in the Canadian civil service. He was active in the construction of the Greater Winnipeg Water District project and later became General Superintendent of the Canadian Lock Joint Pipe Co. in the United States. It was in this capacity that he first came to Cumberland, where he was later to make his home, in order to supervise the installation of a new water line.

Keenly interested in all phases of his field, Mr. Bruce was active in many groups organized to consider water supply problems, and became an Active Member of the Association in 1929.

The sidewalks of New York of the famous ballad looked more like the streets of Venice recently when a 48-in. trunk main, the largest in the distribution system network, burst and flooded four blocks with up to 3 ft. of water. Gushing water from the break, which was under fashionable West 85th St. near Central Park, also filled apartment house cellars, and the force of the escaping water washed away so much supporting soil that in many places the undermined streets and pavements collapsed, menacing gas and other underground utilities.

Although the extent of the damage can only be estimated as in the thousands of dollars, it is known that the only fatalities were those of four goldfish, washed out of a garden pool behind one of the flooded buildings by the swirling waters. And officials of the Bureau of Water Supply were able to boast of having maintained service without interruption. Pressures may have decreased somewhat, but not even the flooded area went without water, as the main only traversed, and did not supply, this region. The report that many of the city's apartment house dwellers are so accustomed to living most of their lives in penthouses that they were unaware of the deluge below, however, is believed an exaggeration.

(*Continued on page 20*)

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REG. U. S. PAT. OFF.

A. D. COOK, INC.
Lawrenceburg • Indiana
Manufacturers of
Vertical Turbine Pumps, 10 to 10,000 gpm.
Well Strainers, 2 to 40 in.
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DEEP WELL COOK PUMPS
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The Smith-Blair Repair Clamp is especially flexible . . . so much so that it easily adjusts itself to any pipe shape . . . being of "non-rigid" design it cannot distort or crush thin-walled or weakened pipe. On standard, riveted, O. D., cast iron or asbestos cement pipe it's the "snuggest-fitting" leak clamp yet!

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COLORADO—Denver, Thompson Pipe & Steel Co., also part of Wyoming and New Mexico.
GEORGIA—Thomasville, Davis Meter Repair Co. for Miss., Ala., Fla., & Georgia.
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OREGON—Portland, Waterworks Supplies Co. for Ore., No. Idaho, Washington Counties of Pacific, Cowlitz, Skamania, Klickitat.
SC. CAROLINA—Sumter, Cities Supply Co., Inc. for Virginia, No. & So. Carolina.
TENNESSEE—Memphis, Viking Supply Co.
TEXAS—Waco, Rohan Co. (entire state).
UTAH—Salt Lake City, Waterworks Equip. Co., for Utah and So. Idaho.
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Other advantages you'll like—

1. **NO HINGES TO BREAK OR BIND**
2. **MAKES A PERMANENT REPAIR**
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5. **SAFEST TO USE ON WEAKENED PIPE**
6. **EQUALIZES ITSELF OVER IRREGULARITIES**

Furnished in all sizes ½" through 24" O. D. Band widths to 30 inches in multiples of 3 inches. Specify if for LOW, MEDIUM, OR HIGH PRESSURE when ordering.

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SOUTH SAN FRANCISCO • CALIFORNIA

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS

(*Continued from page 18*)

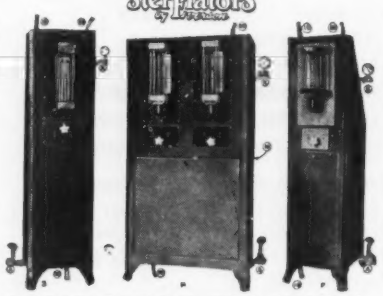
Alexander Rihm Jr., since his release from military service, has been occupying the New York State Dept. of Health post of Assistant to the Chief of the Bureau of Water Supply at Albany. Previously Rihm had been Jr. San. Engr. in the Saranac Lake District Office and then District San. Engr. in the Binghamton District Office of the State Dept. of Health. In 1944 he was given a commission in the Army Sanitary Corps and served as Medical Inspector at Camp Myles Standish, Mass., and at the Seattle Port of Embarkation.

A Super-Hooper rating system has been devised by radio station KYUM officials at Yuma, Ariz., in collaboration with the city's water department. Product of a recent hot spell, the rating system is based on the pressure readings at the local water works. As explained in *Time* magazine: "When Yuma's temperature gets near 110°, everybody goes outside to water the lawn, and local water pressure drops; when a particularly popular program comes on the air, people turn off their hoses, rush inside to listen, and the water pressure jumps again." Thus popularity can be measured directly in pounds per square inch.

(*Continued on page 22*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

Ster-Flators by Everson



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Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

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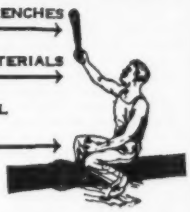
UNIVERSAL
CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.



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296 South Street, Newark 5, New Jersey

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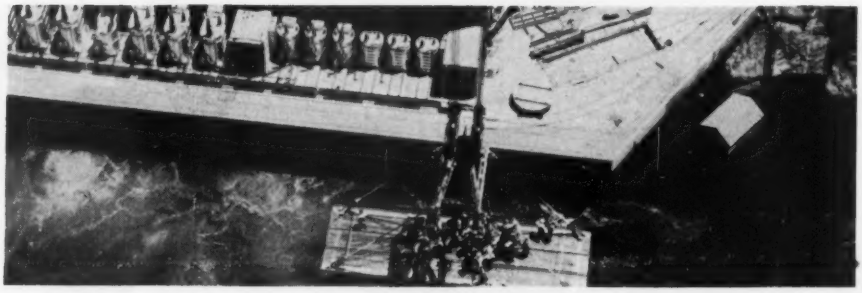
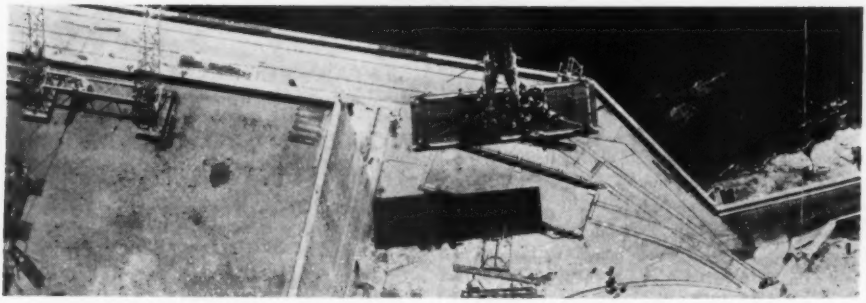
PUMP AND MACHINERY CORPORATION

(*Continued from page 20*)

Sights—and heights—aplenty were furnished those hardy A.W.W.A. and F.S.W.A. members and friends who took advantage of the personally conducted tour to the San Francisco Conference to inspect Hoover Dam. As an incident to their visit, the intrepid among them were given the air—567 ft. of it, from the bottom of the canyon to the landing platform above the top of the dam. Samuel B. Morris, Gen. Mgr. & Chief Engr., Los Angeles Dept. of Water and Power, says there isn't enough water in the Colorado River, and he ought to know (see p. 945, this issue, and, for a photograph of the dam itself, p. 950). But it looks, from the pictures, less like too little than too far away.





Read from the bottom up; that's the way they went; and that's the way they looked to an observer on top.

(*Continued on page 44*)

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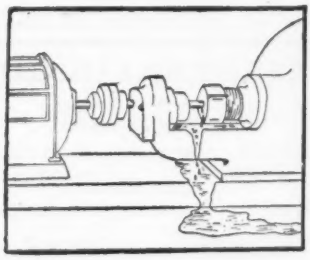

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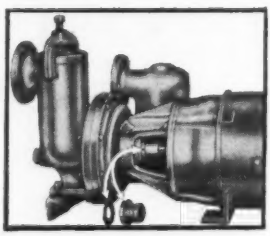

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CHANGES IN MEMBERSHIP

NEW MEMBERS

Applications received August 1 to 31, 1947

Beling, Earl H., Owner, Beling Eng. Consultants, 1407—7th Ave., Moline, Ill. (July '47)

Blidberg, Per Gustaf, Water Works, Gothenburg, Sweden (Jan. '47)

Boyle, William J., Salesman, Hays Mfg. Co., Wolcottville, Ind. (July '47)

Bresler, S. D., Chemist, Filtration Plant, 1425 Hill St., Lima, Ohio (July '47)

Bussmer, Fred C., Sales Engr., Wallace & Tiernan Sales Corp., 5319 Forest, Kansas City 4, Mo. (July '47)

Clark, A. E., Mgr., Nashville Suburban Utility Dist., 929—3rd National Bank Bldg., Nashville, Tenn. (July '47)

Clifton, Harry Patrick, Sr. Civ. Engr., Dept. of Health, Tavistock, 64 Ranelagh Rd., Dublin, Eire (July '47)

Cox, Allen, Water Comr., Wellsville, Mo. (July '47)

Dauphin, Town of, R. Fagen, Secy.-Treas., Dauphin, Man., Can. (Corp. M. Jan. '47)

Davis, William J., *see* Frederick, City of

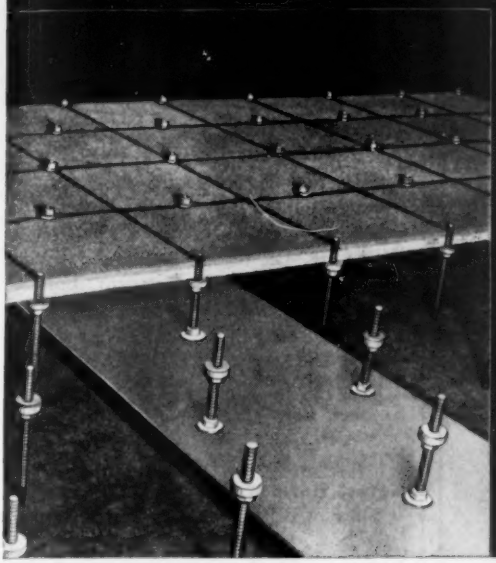
Easton, Thomas G., Private Utility Engr., Consumers Water Co., 119 Giralda Ave., Coral Gables, Fla. (July '47)

Elmira Public Utilities Com., C. C. Rachar, Mgr., Water Works Dept., Box 88, Elmira, Ont., Can. (Corp. M. July '47)

(*Continued on page 30*)

CAMP POROUS BOTTOMS

for Rapid Sand Filters . . .



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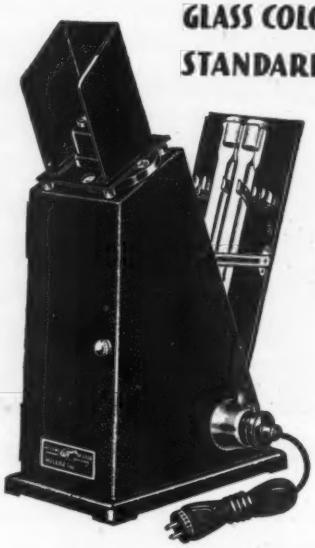

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Write for Bulletin No. 602

HELLIGE

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(*Continued from page 28*)

Evers, Hubert J., *see* Merrill Water Utility

Fagen, R., *see* Dauphin, Town of

Fischel, Daniel N., Mng. Editor, American Water Works Assn., 500—5th Ave., New York 18, N.Y. (July '47)

Fitch, Reamy C., Sr. San. Engr., State Dept. of Health, Box 1226, Phoenix, Ariz. (July '47)

Frederick, City of, Water Dept., William J. Davis, Water Supt., City Hall Bldg., Frederick, Md. (Corp. M. July '47)

Heintz, Joseph J., Jr., Cons. Engr., 14 Landers Lane, Swanwyck, New Castle, Del. (July '47)

House, H. D., Repr., S. F. Bowser Co., Ltd., 28 Walbrooke Crescent, London, Ont., Can. (July '47)

Johnson, Kenneth R., Supt., Water Dept., 426—2nd Ave., E., Dickinson, N.D. (July '47)

Kenwell Corp., S. Kenneth Weiser, Pres. & Gen. Mgr., 416 N. Glendale Ave., Glendale 6, Calif. (Assoc. M. July '47)

Keyes, Harmon E., Cons. Chem. Engr., 508 E. Culver St., Phoenix, Ariz. (July '47)

Ladlow, John W., Sales Repr., Box 1784, Phoenix, Ariz. (July '47)

Mahan, T. N., Mgr., Follansbee Water & Light Co., Follansbee, W.Va. (July '47)

Matthews, Clyde C., Mgr., Arizona Water Co., 421 W. Washington St., Phoenix, Ariz. (July '47)

McMahon, Lee B., Mgr., Ohio Branch, *Water & Sewage Works*, Leader Bldg., Cleveland 14, Ohio (July '47)

Merrill Water Utility, Hubert J. Evers, Mgr., 105 E. 3rd St., Merrill, Wis. (Corp. M. July '47)

Moore, Howard Lee, Supt., Water & Sewerage, Reynolds Metals Co., Jones Mills Aluminum Plant, Malvern, Ark. (July '47)

Palocsay, Frank S., Design Engr., Havens & Emerson, 1140 Leader Bldg., Cleveland 14, Ohio (July '47)

Peterson, York, City Engr. & Water Supt., City Hall, Santa Maria, Calif. (July '47)

Piper, Arthur M., Staff Scientist, U.S. Geological Survey, Box 3418, Portland 8, Ore. (July '47)

(*Continued on page 32*)

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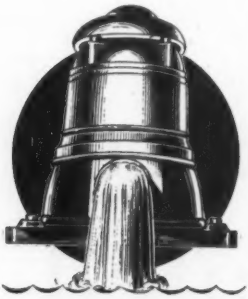

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(*Continued from page 30*)

Rachar, C. C., *see* Elmira Public Utilities

Schmitt, Richard P., 1st Lt., San. Corps, Surgeon's Section, Headquarters 8th Army, APO 343, c/o Postmaster, San Francisco, Calif. (July '47)

Self, Herschel O., Water Accounting & Distr. Supervisor, Div. of Water Supply, 100 City Hall, Flint 3, Mich. (July '47)

Shayler, Stanley V., City Engr., Box 642, Kimberley, B.C., Can. (July '47)

Simmons, Harry A., Supt., Water Dept., Board of Water & Light Comrs., Le Roy, N.Y. (July '47)

Steeg, Henry B., Henry B. Steeg Assocs., 129 E. Market Bldg., Indianapolis 4, Ind. (July '47)

Stewart, Spencer D., Proprietor & Mgr., Southside Water Co., 240 E. Van Buren, Phoenix, Ariz. (July '47)

Strange, I. R., Mayor, Munic. Water Dept., Hot Springs, Mont. (Affil. July '47)

Sullivan, Charles W., Dist. Mgr., Electro Rust-Proofing Corp., Warner Apts., Crescent City, Fla. (July '47)

Swan, Donald O., Head, Petroleum Tech. Service Dept., Standard Oil Co. of New Jersey, Box 551, Baton Rouge, La. (Jan. '47)

Thomas, George E., Clerk, Board of Public Affairs, 9—2nd St., Willoughby, Ohio (July '47)

Tykosky, Victor J., Water Plant Operator, Kaiser-Frazer Corp., Willow Run, Mich. (July '47)

Vanoni, L. R., Owner & Mgr., Coast Springs Water Co., Tomales, Calif. (July '47)

(*Continued on page 34*)

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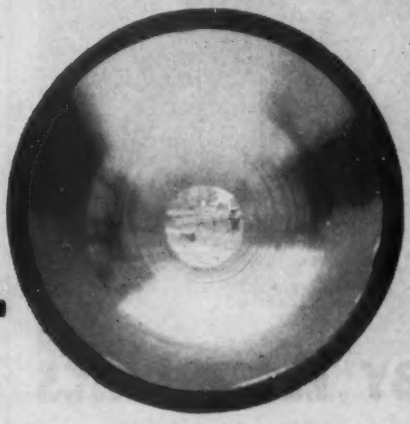

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(*Continued from page 32*)

Waterbury, Clarence L., Supervisor, Fuel & Water Service, Chicago, Milwaukee, St. Paul & Pacific R.R. Co., 898 Union Station, Chicago 6, Ill. (July '47)

Weiser, S. Kenneth, *see* Kenwell Corp.

REINSTATEMENT

Glauber Brass Mfg. Co., The, Sylvan Grotte, Director of Operations, Kinsman, Ohio (Assoc. M. May '14)

Grotte, Sylvan, *see* Glauber Brass Mfg. Co., The

LOSSES

Deaths

Bruce, C. J., Supt., Evitts Creek Water Co., Cumberland, Md. (June '29)

Wallbom, David E., Chief Utility Accountant, Water Dept., 323 County-City Bldg., Seattle 4, Wash. (Jan. '47)

Resignation

O'Mealia, F. J., Le Roy, N.Y. (Jan. '36)

The resignation of R. W. Reynolds, Supt., West Palm Beach Water Co., Box 1311, West Palm Beach, Fla., announced in this column in the August issue was in error. Reynolds transferred from active to corporate status. He is now official representative of West Palm Beach Water Co.

Changes in Address

Changes received between August 5 and September 5, 1947

Barbeito, Arturo Auderut, Civ. Engr., Bolivar 638, Buenos Aires, Argentina (Jan. '45)

Bhoota, Baboobhai V., Taj Mahal Hotel, Bombay 1, India (July '45)

Burchard, Edwin Day, Sylvan Shores, Riva, Md. (Jan. '25)

Burt, Gordon L., 2020 Panhandle Blvd., Richmond, Calif. (Jan. '47)

Campbell, Roderick W., Supt. of Filtration, Water Works, Lorain, Ohio (Jan. '47)

Clark, Joseph R., c/o Robert Celawn, Route No. 2, Owensville, Ind. (Apr. '44)

(*Continued on page 36*)

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(*Continued from page 34*)

Collins, Willis E., Ranieri & Co., Inc., 764 Main St., Glen Ellyn, Ill. (Apr. '46) *P*

Copeland, Ross A., Supt., Pipe Constr., Dept. of Water & Power, 5720—8th Ave., Los Angeles 43, Calif. (Oct. '30)

Cordle, Thomas Llewellin, City Mgr., Morganton, N.C. (Jan. '43) *AMP*

Davis, Don C., City Mgr., 106 W. Garvey Ave., Monterey Park, Calif. (Jan. '41) *M*

Dietz, Jess C., Dept. of Civ. Eng., College of Eng., Univ. of Illinois, Urbana, Ill. (Apr. '47)

Eich, Henry F., 848 S. Stanley Ave., Los Angeles 36, Calif. (Apr. '43) *P*

Elias, George A., Dist. Engr., Bureau of San. Eng., State Dept. of Health, 412 City Centre Bldg., 121 N. Broad St., Philadelphia, Pa. (Jan. '44)

Erganian, George, State Board of Health, 1098 W. Michigan Ave., Indianapolis, Ind. (Jr. M. Apr. '46)

(*Continued on page 38*)

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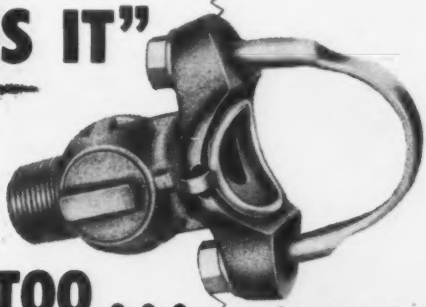

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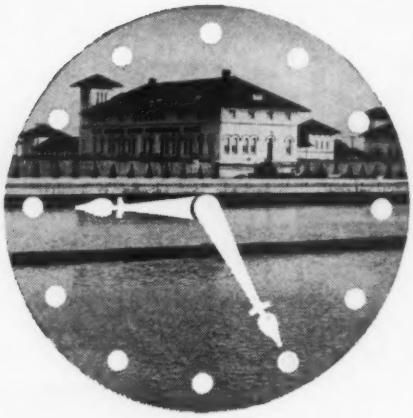

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(Continued from page 36)

Firth, William J., c/o Instituto de Obras Sanitarias, Caracas, Venezuela (Jan. '43) *P*

Fleming, Edward H., Mojave Div., Dept. of Water & Power, Box 188, Mojave, Calif. (Oct. '34) *P*

Fulton, Edward A., Cons. Engr., 3229 Brown Rd., St. Louis 14, Mo. (Apr. '46)

Goudey, Ray F., 3845 Aloha St., Los Angeles 27, Calif. (Apr. '18) *Fuller Award '40. Goodell Prize '42. Director '45–'48. P*

Grady, Robert H., 925 Sedgefield Rd., Charlotte, N.C. (Jan. '40)

Guenther, Ralph C., Pres., Brining-Guenther, Inc., 1121 Beyers Ave., South Bend 15, Ind. (July '45) *P*

Hearne, Paul W., Chief Chemist, W. D. Johnson Chemical Labs., Inc., 3605 Elm Ave., Long Beach 7, Calif. (Jan. '47)

Henderson, Paul C., U.S. Public Health Service, 1152 U.S. Appraisers Bldg., San Francisco, Calif. (Apr. '46)

Herringer, E. J., San. Engr., U.S. Public Health Service, 15 Pine St., New York 5, N.Y. (Oct. '46)

Horn, Theodore C., 26—19th St., Huntington Station, N.Y. (Oct. '46)

Jacoby, Gordon C., Treas., Jacoby, McGrayne & Co., 195 Van Houten St., Paterson, N.J. (Oct. '46)

Johnson, Hamilton K., San. Engr., Pacific Water Works Supply Co., 2900—1st Ave., S., Seattle 4, Wash. (Apr. '46)

Johnson, Paul H., 203 N. Lincoln Ave., Park Ridge, Ill. (Jan. '47)

Kendrick, Edward J., 6 Carver Pl., Huntington, N.Y. (Jr. M. Apr. '46)

Knoener, Charles J., 1461 Western Ave., Albany, N.Y. (July '40)

Kysar, J. P., Gen. Mgr., K. W. Eng. Co., 2100 S. 55th St., Lincoln 6, Neb. (Jan. '47)

Lauter, Carl J., Chem. Engr., 5902 Dalecarlia Pl., N.W., Washington 16, D.C. (Apr. '22) *Fuller Award '42. Director '45–'48. M P*

Lee, Ernest F., Supt., Public Works, Lake Jackson, Tex. (Jan. '47)

MacKenzie, Vernon G., San. Engr., 41 W. Washington St., Kensington, Md. (July '43)

(Continued on page 40)

HYDRO-TITE

JUST POUR

THAT'S ALL

Hydro-tite, the self-caulking, self-sealing, pipe-jointing compound, solidifies and hardens immediately without shrinkage. No caulking is necessary. Any slight seepage that may appear at first soon stops.

For over thirty years Hydro-tite has proved its ability to stand up under all conditions of strain, vibration and pressure. Send for data book and sample.

ALWAYS USE FIBREX

The sanitary, bacteria-free packing that costs about 30% less than braided jute. Send for sample.

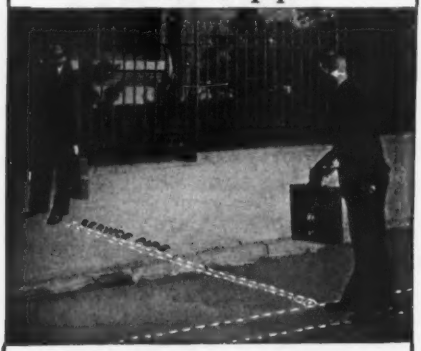
HYDRAULIC DEVELOPMENT CORPORATION

Main Sales Office 50 Church St., New York, N. Y.

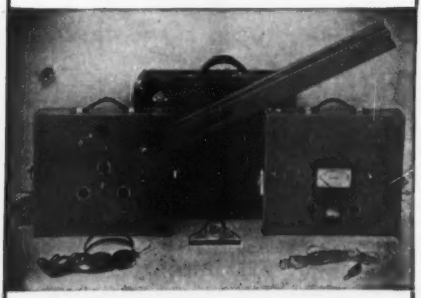
Works: West Medford Station, Boston, Mass.

The Old Way

The New Way
to locate pipe



with the
M-SCOPE



. . . the instrument that takes every bit of guess work out of locating buried pipe, valves, boxes, service stubs, etc. Write for bulletin No. 6.

JOSEPH G. POLLARD CO., Inc.
PIPE LINE EQUIPMENT
145 Ashland Place, Brooklyn 1, N.Y.

(*Continued from page 38*)

Main, T. C., Main & Rensaa, Cons. Engrs., MacCosham Bldg., Edmonton, Alta., Can. (Jan. '37)

McDaniel, Boyd J., City Mgr., Abilene, Tex. (July '38) *AMP*

McEntee, Harry E., 46 Broadway, Mt. Clemens, Mich. (July '38)

Merryman, Harold W., Asst. San. Engr., State Board of Health, 829 S. 11th St., Corvallis, Ore. (July '47)

Miller, Woodrow, City Councilman, Box 12, Colton, Calif. (Oct. '46)

Newton, Harry E., Civ. Engr., Kane, Pa. (Oct. '40) *M*

Piner, Raymond E., 523 E. Delmar St., Springfield 4, Mo. (July '35) *P*

Porter, Oscar S., Jr., Dist. Engr., Wallace & Tiernan Co., Inc., 1328 N.W. 23rd St., Oklahoma City 6, Okla. (Jr. M. Jan. '47)

Randall, Fred, Water Chemist, Analyst, Kaiser-Frazer Corp., 2098—20th St., Wyandotte, Mich. (July '46)

Reinhardt, A. W., 729 N. Michigan Ave., Pasadena 6, Calif. (Jan. '43) *P*

Roux, Maurice G., Lock Joint Pipe Co., 130 E. 39th St., New York, N.Y. (May '33) *AM*

Ruehl, Edward H., 401 Virginia Bldg., 5th & Main Sts., Richmond 19, Va. (July '35) *MP*

Schaefer, Walter A., 38 Prince St., Elizabeth 3, N.J. (Jan. '37)

Schmidt, Howard D., Creole Petroleum Corp., c/o Camp Boss Office, Apdo. 172, Maracaibo, Venezuela (Apr. '36) *Fuller Award '40. Director '41–'42.*

Schouten, Ernest W., Dist. Mgr., Wallace & Tiernan Co., Inc., 1328 N.W. 23rd St., Oklahoma City 6, Okla. (Jan. '39) *P*

Vandenberg, Alfred John, 3305 Garfield Ave., Alameda, Calif. (Oct. '44)

West, Francis D., 5237 Wissahickon Ave., Philadelphia 44, Pa. (June '30) *P*

Western Pipe & Steel Co. of California, P. M. Cobb, Vice-Pres., 141 Battery, San Francisco 11, Calif. (Assoc. M. Aug. '24)

Wirz, Herman, Jr., Field Supt., Dept. of Water & Power, 3330 Mary St., La Crescenta, Calif. (Oct. '43) *M*

Wood, Alan A., Wood & Preuit Co., 1740 K St., N.W., Washington 6, D.C. (Jan. '44) *P*

DEEP WELL CENTRIFUGAL PUMPS

5,000 GALLONS PER MINUTE—5 STAGE—UNUSED

These deep well pumps are priced right for immediate action and your city or company can secure immediate delivery. Here's a partial description . write, phone or wire for additional information.

Five stage, 5,000 gallons per minute deep well pump for total head of 500 feet. For installation in well having minimum inside diameter of 24 inches. Pump No. 24, Serial Numbers 15806 and 15807 of Peerless Pump Division of Food Machinery Corporation.

Direct connection to 800 Horsepower, 3 Phase, 60 Cycle, Squirrel Cage, 1185 RPM, 6600 Volt, Frame 579, Open, 40°C. Vertical hollow shaft motor with water cooled thrust bearing, Model 97-E 379-G1. Full voltage, starting current of motor is 420 amperes. Serial Numbers 5655523 and 5655524 of General Electric Company.

Flanged wrought steel pipe, 16 inches outside diameter, 3/8 inches thick, shafting, couplings, bearings, etc., for setting of pump suction opening 58 feet 2 inches below the base flange of the discharge elbow and motor pedestal. The discharge flange is 15 1/2 inches inside diameter and 25 3/4 inches outside diameter and has 20 bolt holes for 1 1/4 inch bolts on 22 1/2 inch bolt circle. Suction opening of pump 17 inches.

Fuse mountings and manually operated oil switch in sheet steel cubicle for full voltage start of motor. Westinghouse Electric and Manufacturing Company.

PRICE EACH, $15,600 F.O.B. CHARLESTOWN, IND.

All sales are subject to legal priorities and standard WAA Conditions of Sale which may be secured at your Customer Service Center. Sale opens: September 18, 1947. Sale closes: October 20, 1947.

Quick service in closing all sales from War Surplus. Write, phone, or wire today. Ask for listing No. LSO-63-575.

WAR ASSETS ADMINISTRATION

CUSTOMER SERVICE CENTER
410 W. JEFFERSON ST. LOUISVILLE, KY.
Telephone: JAckson 3251

LS-118

COLD FACTS ABOUT THE

One book of facts can be worth more than a library of books based on conjecture.

Such a book* of facts has recently been published by the American Water Works Association. It records the findings of a study of "Survival and Retirement Experience With Water Works Facilities" in 25 cities.

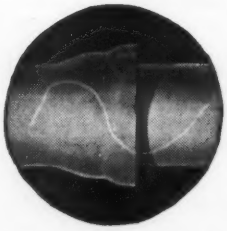
With the permission of the A.W.W.A., we have reprinted, in brochure form, the facts as they apply to cast iron pipe. This brochure is available on request. Write to the Cast Iron Pipe Research Association, Peoples Gas Bldg., Chicago 3, Illinois, and ask for a copy of "Survival and Retirement Experience With Cast Iron Water Mains."

A feature of this brochure is a chart showing the percentage of cast iron water mains that have survived out of all such mains laid by these 25 cities from the first, some as early as 1817. For example, in sizes 6-inch and over, *more than 90 per cent of all the cast iron pipe that has ever been laid in these cities is still in service.*

Tabulations showing in detail the survival and retirement experience with cast iron water mains, in various sizes, are given for each city; also experience with cement-lined cast iron pipe in the 16 cities that have installed it.

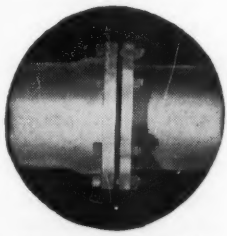
*Available from American Water Works Association, 500 Fifth Ave., New York.

Joints for Cast Iron Pipe



Bell-and-Spigot Joint: the standard joint for water and sewerage service.

A variety of joints are available, of which the two most widely used are illustrated. Special purpose joints, such as the Ball-and-Socket, or Flexible Joint for underwater use, and the Flanged Joint for above-ground use, are also available.



Mechanical Joint: bottle-tight and flexible, now with interchangeable parts.

CAST IRON PIPE

LIFE OF WATER MAINS

The 25 cities were carefully selected to comprise a representative cross-section of conditions; the study was concerned solely with discovering and reporting the facts.

For your convenience and quick reference, we have reprinted such facts as apply to cast iron pipe only —facts which leave no room for conjecture if what you want is water mains with assured long life and efficient life.

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

"SILENT SERVICE is not enough"—A.W.W.A.

The American Water Works Association is recommending to its members, for local action, a sound, well-planned program of Public Relations publicity and advertising. It is based on the premise that good water service, like good health, is too often taken for granted, in which case favorable public opinion is dormant.

To co-operate with this program and help to arouse national recognition of the efficient service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* readers of "Time" and "Nation's Business" throughout 1947.

For example, the following human-interest cartoon and excerpts from a current advertisement

"extra!—*read all about it*"

All this excitement about water? Well, if you lived in one of the 5700 towns* that need a water supply system, or any town that needs improvement to its water supply system, you'd understand. An abundant supply of potable water makes life easier, safeguards health and property, attracts industry, rarely increases taxes. The cost of installing or improving a municipal water supply system is usually financed by a bond issue to be liquidated out of revenue from a low delivered cost to the consumer—a cost that averages less than a dime for a ton of safe and palatable water.

Because of the efficient and economical operation of America's water supply systems, water works construction or improvement bonds are rated among the most stable of investments, and have a ready market at a low rate of interest.

*U. S. Public Health Survey, released July 6, 1947

Cast Iron Pipe Research Association, Thos. F. Wolfe, Engineer, Peoples Gas Building, Chicago 3, Illinois.

SERVES FOR CENTURIES

(*Continued from page 22*)

An editorial in a recent issue of *Chemical and Engineering News* expresses the hopes and fears of its publishers regarding government publication subsidies. Reviewing the Steelman report on "Science and Public Policy," the editors point out that a realization of the goal of doubling research expenditures by 1957 will place an unbearable burden on scientific publications and the technical societies which publish them. Arguing that the results of scientific research must be freely disseminated to be really useful and that new advertising and subscription income cannot possibly keep pace with a doubling of present publication volume, they point to the possibility of government subsidy as the logical means of financing the increased burden and then proceed to air their fears that such subsidies will restrict the editorial freedom now exercised by the scientific and technical journals of this country. Their closing question is: "Are we unduly alarmed about what may happen to editorial freedom if we are forced to accept government subsidies?"

Perhaps not, but we believe the editors are "unduly alarmed" in considering the subsidy solution as virtually inevitable. We have always felt that the field of science was large enough to offer elbow room to all inclined to research—that the really important research was more cooperative than competitive. For many years the government has been subsidizing and conducting much important research, the results of which have been broadcast. Scientists and scientific organizations have been free not only to employ the results, but to criticize and comment upon them freely. If private organizations cannot keep publication pace with a growing body of research, what sinister purpose will be served if the government itself publishes the results of the research it sponsors and thus makes that information available to those who can use and profit by it? Through such means the important purpose of dissemination will be served without imposing additional burdens upon the private publications in which space is at a premium. At the same time, those publications will be free to compliment or castigate the public conclusions reached by government or government-subsidized researchers with no greater fears of financial retribution than they now face. Certainly such a process will not involve the "extinction of our learned societies in the form they now exist" as predicted if the government subsidizes the present publications of scientific and technical organizations.

Once the Congress decides that the interests of the country will be best served by promoting scientific research through subsidy, it will be far better for technical associations to take advantage of that research than to resist the accomplished fact. With the direction and purpose of the research itself we may well argue later, but with the basic wisdom of expanding scientific inquiry, no "learned society" can properly disagree.

(*Continued on page 46*)

20" O.D. 1/2" Wall
Armco Pipe Made to
A.W.W.A. Specifications

HAS STRENGTH TO
WITHSTAND PRESSURES
OF 2500 PSI! *

Write for full information on ARMCO Spiral Welded Steel Pipe (diameters 6 to 36 inches, wall thicknesses 7/64 to ½-inch). Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 2775 Curtis Street, Middletown, Ohio.

*Ultimate strength 50,000-60,000 psi.; yield strength 30,000-40,000 psi.; elongation in 2 inches, 30%.

ARMCO

ARMCO STEEL PIPE

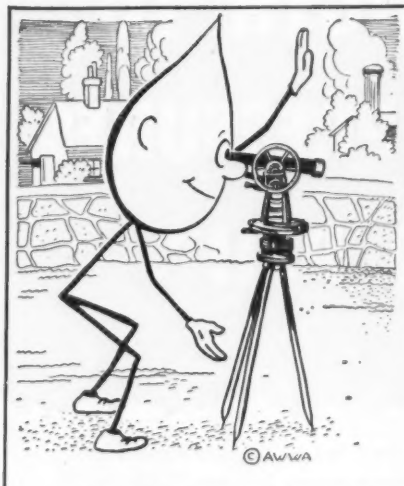
(*Continued from page 44*)

Willis L. Ogden has recently accepted a position as San. Engr. with Yeoman's Bros. Co., Chicago. Educated at the Univ. of Illinois, Ogden also attended Harvard Univ. and received his master's degree in sanitary engineering after first having served two years in the U.S.P.H.S.

The Pitometer Co. announces the reopening of its Albany, N.Y., office, which had been closed during the war. Charles J. Knoener, Dist. Mgr. for New York and the New England States, is in charge of the office, which is located at 1461 Western Ave., Albany.

Joseph A. Novaro has been admitted to membership in the firm of Clarence Blair Associates, Cons. Engrs., New Haven, Conn., after a period of service with that organization which began in 1928. In 1941 he was called to active duty with the Army Corps of Engineers, and served at the Puerto Rico District Engr. Office and at the Antilles Div. Engr. Office, San Juan, P.R. His assignments included: Designer of Tank Farm Installations; Chief of the Inspection Div.; Area Engr. of the San Juan Area; Water Supply Officer, Engr. Member of the Puerto Rico Sector Malaria Board and, finally, Project Engr. on new water works facilities for San Juan.

(*Continued on page 48*)



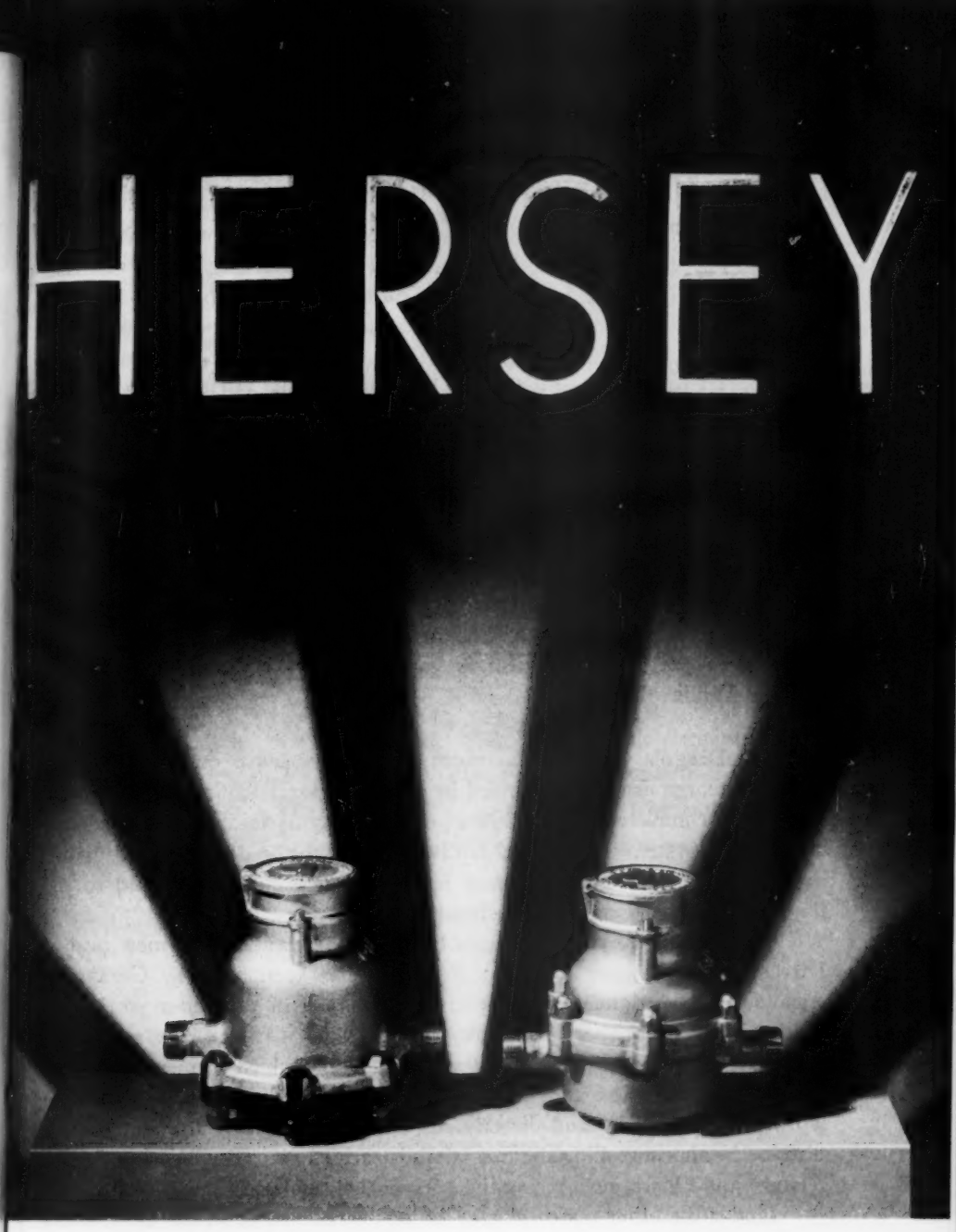
Mapping out a Public Relations Campaign?

Let Willing Water help you . . . he's the master of all he surveys. Let him clear the brush of public ignorance of water works problems. Let him erect for you an edifice of public appreciation and co-operation on a foundation of good will.

Willing Water is waiting to meet your customers and employees. Right now he has 32 different approaches to your problems in the form of low-cost blocked electrotypes or newspaper mats. And he's only beginning his career. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
500 Fifth Avenue · New York 18, New York

HERSEY



Standardizing on . . .

HERSEY WATER METERS

. . . is a wise move

More than half a century of precision engineering assures accuracy, dependability and low maintenance cost demanded by experienced water works officials.

HERSEY MANUFACTURING COMPANY

SOUTH BOSTON, MASS.

BRANCH OFFICES: NEW YORK — PORTLAND, ORE. — PHILADELPHIA — ATLANTA — DALLAS — CHICAGO
SAN FRANCISCO — LOS ANGELES

(*Continued from page 46*)

A termite's hoard was discovered recently on a farm near Noblesville, Ind., by well drillers seeking water there. According to the reports, the well had been drilled to a depth of 95 ft. when wood pulp began to come to the surface. Estimates placed the diameter of the buried log at from 2 to 3 ft., and, from all indications, it appeared to be in an excellent state of preservation. Who put it there, when and for what purpose was a complete puzzle to the local citizenry, but A.W.W.A.'s Dept. of Squirrel and Insect Psychology identified the culprit at first deduction.

Willing Water took a bow in the August 1947 issue of *Domestic Commerce,* official bulletin of the U.S. Department of Commerce. Reproducing one of the "Stop Water Waste," cartoons, the bulletin identified our "Willie" as a "key figure in helping local water utility companies do a better public relations job." As a matter of fact, his antibody, "The Drip" (introduced in the August issue), is having trouble brewing mischief because of Willie's headstart.

San Diego's water department got a new lease on life recently when the reorganization authorized by a city charter amendment last March was finally completed. Tied down previously by a rigidly established administrative system which could not be adjusted to the demands of a growing city, the organization has now been expanded and modernized to set the water department up in business for itself.

One of the two major changes has been the creation of a new post—Director of the Water Department—which has been filled by Gerald E. Arnold, who previously was responsible for most of the water works activities in his capacity as Assistant City Manager. In the new set-up, he will relieve the City Manager of the many details which formerly required his personal attention and take over full supervision of the department's work. Appointed by and directly responsible to the director will be five division heads controlling the five administrative units: Engineering, Maintenance and Operation, Accounting, Sanitation, and Recreation.

Under the other major change brought about through the amendment of the charter, Water Department accounts and funds will for the first time be separated from the general funds of the city. This will allow the utility to provide its own reserves for depreciation and new construction and to allocate its surpluses to the best interests of the department itself without reference to the City Council. Particularly because the San Diego supply fluctuates significantly with the rainfall cycle, the flexibility allowed by financial self-government is an important step in placing the utility on an efficient business basis.

(*Continued on page 50*)

is the water this good in your town?

The whole community is pleased when its water is pure and good to drink—when unpleasant tastes and odors have been removed ... and Mathieson's Chlorine Dioxide treatment takes care of that!

Chlorine Dioxide destroys phenols, algae and other contaminants ... is an effective bactericide as well. The Mathieson method of treating water eliminates unpleasant tastes and odors ... even those which so often are the aftermath of floods, melting snow and ice.

Every water works superintendent should be familiar with the Mathieson Chlorine Dioxide treatment—the technique that is bringing good, safe water to so many communities. Write us for details. THE MATHIESON ALKALI WORKS (Inc.), 60 East 42nd Street, New York 17, N. Y.

Mathieson
CHLORINE DIOXIDE

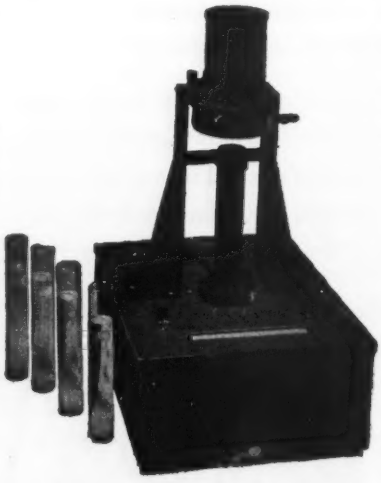
Chlorine Dioxide . . . Sanitation HTH
Liquid Chlorine . . . PH-Plus (Fused Alkali)
Caustic Soda . . . Soda Ash . . . Bicarbonate of Soda . . . Ammonia, Anhydrous & Aqua
Carbonic Gas . . . Dry Ice . . . Sodium Chlorite Products . . . Sodium Methylate

(*Continued from page 48*)

Stonhard Co., Philadelphia manufacturer of building maintenance materials, has issued a 48-page handbook, entitled "Over the Rough Spots," in which are described the solutions to more than a hundred problems inherent in the maintenance and construction of all types of industrial buildings. If you're having trouble with your floors, walls, roofs, foundations, you may find the answer either in the general discussion or in the pages devoted to the special problems of public utilities and of water works. A free copy of the guide may be obtained by addressing the company at 403 N. Broad St., Philadelphia 8, Pa.

U. S. Pipe & Foundry Co., Burlington, N. J., recently announced a number of changes in its sales department personnel. Retiring on June 30 were: Robert W. Martindale, Pacific Coast Sales Mgr.; William G. Savage, Western Sales Mgr.; and Thomas Simons, Southern Sales Mgr. Appointed as of July 1 were the following: A. Raymond Hausmann, Pacific Coast Sales Mgr.; P. King Farrington, Asst. Pacific Coast Sales Mgr.; Carl N. Brown, Western Sales Mgr.; J. Leslie Hart, Asst. Western Sales Mgr.; Thomas W. McCreery, Southern Sales Mgr.; and Robert C. Lemert, Asst. Southern Sales Mgr.

(*Continued on page 52*)



LUMETRON

Photoelectric Colorimeter Mod. 450 for Nessler Tubes

A new photoelectric instrument of high accuracy for the measurement of color and turbidity as well as for all analytical colorimetric tests in the sanitary examination of potable and purified water.

- Turbidity tests in terms of APHA (ppm) scale.
- Color tests in terms of APHA (mg Pt) scale.
- Suited for determination of ammonia nitrogen, nitrate, nitrite, and for all other colorimetric tests according to APHA "Standard Methods."

Operates with all "low-form" Nessler tubes 32 mm O.D., 200 mm high. Requires no matched sets of tubes.

LUMETRON Mod. 450 eliminates the uncertainties of visual matching methods. It requires no permanent color standards and furnishes reproducible results independent of individual judgment and of light conditions.

Write for literature to

PHOTOVOLT CORP.

95 Madison Ave. **New York 16, N. Y.**

One smashed hydrant.....

replaced by one man.....

in half an hour.....

with replacement parts.....

costing only.....

When the Kennedy Safetop Hydrant is struck by a vehicle with a force which no hydrant could withstand, the upper portion of the standpipe breaks off cleanly. There is no flood or geyser...less likelihood of injury to persons or property.

This is an *extra* hydrant feature which results in lower maintenance cost and greater community safety. It explains why more and more communities are standardizing on SAFETOPS.

THE KENNEDY VALVE MFG. CO. • ELMIRA, N. Y.

KV-160

SAFETOP FEATURES

SIMPLE, PRACTICAL DESIGN
No complicated parts which might stick or fail.

LOW PRESSURE LOSS
Smooth, specially shaped interiors facilitate flow, eliminate turbulence.

WINTER RESISTANCE
Drain valves assure drainage of stand-pipe when main valve is closed, avoids damage due to freezing.

QUICK, DEPENDABLE RESPONSE
Assured by direct-action mechanism and stream-lined interior.

STURDY, LONG-LIFE CONSTRUCTION
Strong metal, thick standpipe, bolete-faced valve.

ECONOMICAL MAINTENANCE
A few minutes for routine inspection, test operation and oiling of stem threads twice a year is the only maintenance ordinarily required.

Plus THE SAFETY BREAKABLE SECTION, PIONEERED BY KENNEDY

KENNEDY *Safetop* HYDRANT

(*Continued from page 50*)

Gannett Fleming Corddry & Carpenter, Inc., Consulting Engineers of Harrisburg, Pa., have announced the appointment of C. C. Wilbur and Lawrence G. Rice to the engineering staff. Wilbur has been placed in charge of the organization's new branch office in Scranton, Pa., from which he will handle all projects in the northeastern part of the state. Rice will devote his energies to the field of sewage treatment as chief designer in that department of the firm.

Stationary diesel engines of the Superior Engine Div., National Supply Co., are described and illustrated in a new 28-page bulletin filled with photographs, performance charts, ratings and specifications. Just before the war Superior completed a $250,000 research laboratory and now is carrying out an expansion and improvement program for which $1,525,000 has been allotted by the parent company.

Copies of bulletin 4705 on these four-cycle, cold starting, mechanical injection stationary diesels may be obtained upon request from the General Sales Office, Superior Engine Div., Springfield, Ohio.

The Dorr Co., New York, wedded science to art in completing its new pilot plant addition to the Westport Mill, Westport, Conn., research and testing laboratories. On the outside east wall of the new building, a stucco face with two banks of windows, Eric Stocklassa, Swedish artist, has painted a mural depicting the history and operations of the company. Directly bonded with the stucco surface by chemical reaction, the mineral colors of the design are expected to last the lifetime of the building, thus perpetuating a graphic record of Dorr equipment and methods. Included on the panel are representations of the company's classifier, agitator, and countercurrent decantation side by side with sketches of the original processing methods they replaced and intermingled with figures symbolizing various phases of engineering and personalities within the organization.

(*Continued on page 54*)

Cut Your Packing Costs!

by using

MABBS RAWHIDE PACKING

on your Pumps and Valve Stems

Frictionless — it saves power; lasts for years

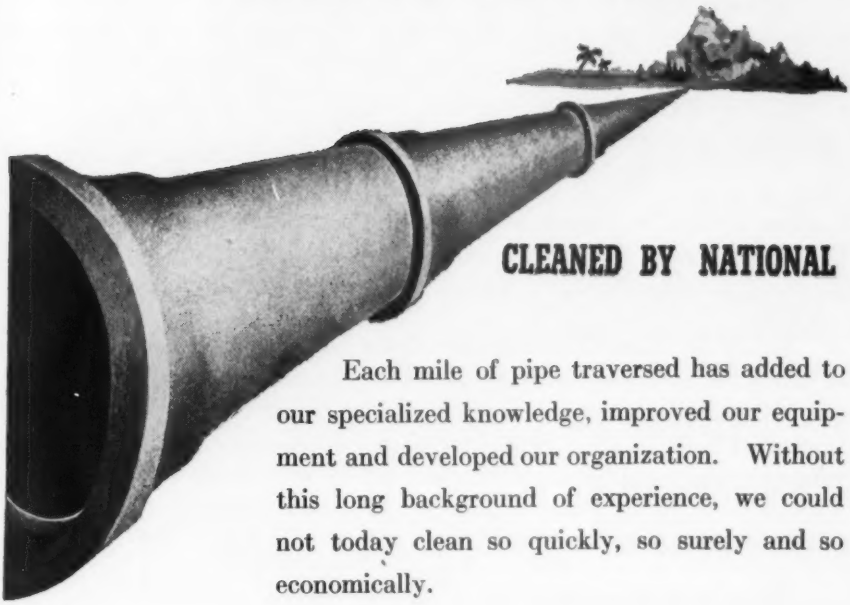
Free Sample and Literature Upon Request

MABBS HYDRAULIC PACKING CO.

Incorporated 1892

431 S. Dearborn St. Chicago 5, Ill.

36,960,000 FEET OF PIPE



CLEANED BY NATIONAL

Each mile of pipe traversed has added to our specialized knowledge, improved our equipment and developed our organization. Without this long background of experience, we could not today clean so quickly, so surely and so economically.

Such experience helps you as much as it helps us for the quicker and better we clean, the less your services are interrupted, the less supplementary labor you supply and the more sure you are of satisfaction.

BEFORE AFTER

National "Know-How" Pays

NATIONAL WATER MAIN CLEANING COMPANY

50 CHURCH STREET, NEW YORK 7, N. Y.

ATLANTA.....1221 Mortgage Guarantee Building
BOSTON.....115 Peterboro Street
CHICAGO.....205 West Wacker Drive
HOUSTON.....2518 Grant Street
KANSAS CITY.....421 B.M.A. Building
LOS ANGELES.....448 South Hill Street
MEMPHIS.....822 Dermon Building
OMAHA.....3812 Castellar Street
RICHMOND.....210 East Franklin Street
ST. LOUIS.....7103 Dale Avenue
SALT LAKE CITY....149-151 W. Second South Street
SAN FRANCISCO.....681 Market Street
MONTREAL.....2028 Union Avenue
WACO.....P. O. Box 887
WINNIPEG.....576 Wall Street
HAVANA · MAYAGUEZ, PUERTO RICO · BOGOTA · CARACAS · MEXICO CITY

(*Continued from page 52*)

Nancy, cartoon creation of Ernie Bushmiller, United Features Syndicate, gave the comic strip readers of the country her simple solution to the problem of water shortage last July 19. Hearing a radio plea to conserve water because the supply at the city reservoir was below normal, Mama's little helper filled a bucket at the kitchen tap, rushed down to the reservoir and poured in her contribution. The only unfunny thing about the situation is the number of solid citizens who may well have been tempted to do the same thing.

Clifford Fore, Fuller Award winner of the Illinois Section and formerly Supt. of Municipal Water Works and Sewage Treatment at Carbondale, Ill., has been appointed Asst. Gen. Mgr. of the Illinois Cities Water Co. The new position carries with it the responsibility for supervision of the water works at Robinson, Tuscola, Palestine and Lawrenceville, Ill.

Harry N. Lendall, Chairman of the Dept. of Civ. Eng. and Prof. of Munic. & San. Eng. at Rutgers Univ., New Brunswick, N.J., was appointed to serve a seven-year term on the newly created Public Health Council of New Jersey. Prof. Lendall is a member of the Interstate Sanitation Commission of New York, New Jersey and Connecticut, and served with the New Jersey Board of Health until its termination under the Dept. of Health reorganization which became effective on July 1, 1947.

John T. Norgaard, formerly Sr. Civ. Engr. with the U.S. Public Health Service in San Francisco, has joined the firm of K. W. Brown, Cons. Engrs., of that city. Norgaard served as a member of the Chief of Engineers' staff in Washington during the war.

Launching the fall campaigns of the Community Chests of 1,000 communities in the U.S. and Canada is the familiar red feather, traditional badge of courage and chivalry, and now symbolic of man's faith in man, and in his willingness to share his blessings. The aggregate goals of the individual campaigns is $180,000,000, which is probably the largest peacetime and purely voluntary fund-raising goal ever set. The money raised by each community is spent locally to aid any and all in need.

(*Continued on page 56*)

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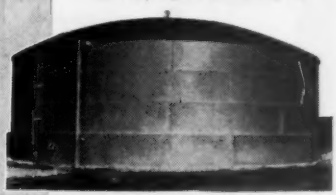
Steel Reservoirs

1,100,000-gallon steel reservoir, with ellipsoidal roof and ornamental pilasters. Diameter 80', height to roof 51'. Midland, Tex.

Two 3,000,000-gallon steel reservoirs, diameter 144', height 25'. Berryville, Va.



1,000,000-gallon steel reservoir, diameter 84'3", height 24'10". Bottineau, N.D.

1,500,000-gallon steel reservoir, with ornamental cornice. Capitol Heights, Md.

400,000-gallon steel reservoir, ellipsoidal roof; diameter 48', height 25'. Fort Benton, Mont.

Two 100,000-gallon steel reservoirs, cone roof; diameter 30', height 21'. Atlantic, Iowa

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SEATTLE, 532 FIRST AVENUE SOUTH

(*Continued from page 54*)

Arthur H. Holloway, San. Engr., has returned to the Health and Sanitation Div. of the Institute of Inter-American Affairs after a one-year interval, during which he took advantage of a scholarship granted by the National Foundation for Infantile Paralysis to do graduate work at Johns Hopkins Univ. leading to an M.S. degree in Public Health Engineering. Currently Holloway's assignment is at Vitoria, Brazil.

A new technical bulletin on water treatment, entitled "Alkalies and Chlorine in the Treatment of Municipal and Industrial Waters," is being offered by the Solvay Sales Corp. to those responsible for water supply in industrial plants, water departments, power stations and ice plants. The bulletin is 94 pages long and contains sections on softening, purification, taste and odor removal, corrosion control, boiler feed water treatment, the use of alkalies, chlorine and other chemicals and equipment, as well as lists of standard reference works on many of the subjects covered. Requests should be made to the Advertising and Sales Promotion Dept., Solvay Sales Corp., 40 Rector St., New York 6, N.Y., for Technical and Engineering Bulletin No. 8.

(*Continued on page 58*)

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M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

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Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

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Showing the ease with which two men can handle long lengths of 8" "Century" Asbestos-Cement Pipe.

How this light weight pipe puts you ahead 4 ways

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You save four ways on *light weight alone* when you specify K&M "Century" Asbestos-Cement Pipe for mains and pipe-lines. Check these four cost-cutting advantages:

1. Lower shipping costs—substantial weight differential reflects itself in reduced freight costs . . . faster, more economical haulage to the work site.

2. Lower handling costs—two men can easily handle long lengths of "Century" Pipe—no expensive mechanical handling equipment is needed.

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You realize further economies, too . . . for once the line is down, "Century" Pipe is virtually maintenance-free. It's immune to tuberculation, corrosion, electrolysis . . . is strong, durable, actually grows *tougher* with age. Salvage value is practically 100%. Write us for full particulars on this leader in low-cost-per-mile.

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(*Continued from page 56*)

Anti-strike legislation directed against public employees is now on the books, in one form or another, in eleven states. In ten of these states, the laws were passed this year; in the eleventh—Virginia—the legislation was enacted only a year ago. It is therefore readily apparent that the "negative" approach to labor disputes which A.W.W.A. Past-President Wendell R. LaDue described in his paper "Significance of Legislation Forbidding Strikes by Public Employees" (Sept. 1947 Journal, Vol. 39, p. 847) is still vigorously on the increase.

In Michigan, Missouri, Nebraska, New York, Pennsylvania and Texas, strikes by public employees are generally declared illegal. In Indiana, Minnesota, New Jersey and Washington, only certain groups are forbidden to strike. In Indiana and New Jersey public utility employees are affected; in Minnesota hospital employees are singled out. In Missouri one law prohibits strikes by employees of either publicly or privately owned utilities and another outlaws strikes by public employees in general. In Texas a thorough combination of laws prohibits municipalities from making labor contracts, forbids strikes against the state or any of its political subdivisions, and finally makes it illegal to picket water, gas or electric plants. In the state of Washington, not only the act of striking but even membership in a union which asserts the right to strike against the government is punishable by a fine of $1,000 and a year in jail, if the offender has accepted state funds as part or all of his salary.

Herbert A. Griffey has retired as Supt. of the Water Dept., Janesville, Wis., after 50 years of continuous service. Griffey became Chief Engr. of the Janesville Water Co. in 1899, when the city had a population of 13,000 and consumed 400,000 gpd. He was appointed Water System Supt. in 1915, when the utility became city-owned, and supervised the rapid growth of the system in its attempt to keep pace with the demands of a rapidly expanding industrial city. Today the population of Janesville has about doubled and its water consumption has increased over eight times, to 3.5 mgd. Griffey plans to spend his well-earned rest with his daughter in Honolulu.

"The Centriline Process," an extensively illustrated 28-page booklet describing the centrifugal application of cement-mortar linings for water mains, has just been issued and is available from the Centriline Corp., 140 Cedar St., New York 6, N.Y. The brochure also includes information on the development of main reconditioning, the effectiveness of cement linings, coefficient improvement, the reclamation of abandoned lines and the protection of new steel mains. Requests from water works engineers and public officials should be made on their business stationery.

(*Continued on page 60*)

for the entire U.S.A.

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De Laval centrifugal water works pumps built to date have a total capacity of approximately 20 billion gallons daily—more than enough to supply all water requirements of the entire population of the United States. The City of Chicago, alone, is served by De Laval pumps having a total capacity of over one billion gallons daily; St. Louis, six hundred million; Cleveland, seven hundred million; Philadelphia, three hundred million; and so on down the list. In fact, 78% of all American cities of over 100,000 population are served by De Laval water works pumps.

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(*Continued from page 58*)

A mammoth meter, large enough to supply the average consumption of a city of more than 45,000 population, was installed recently by the Los Angeles Dept. of Water and Power to serve a new industrial customer —a Chevrolet automobile and truck factory and its affiliated Fisher Body plant. The largest meter ever designed and built for the department, it weighs nearly three tons and has an operating capacity of 3,600 gpm., or 6 mgd. Department engineers collaborated with the Hersey Meter Mfg. Co., which built it, in designing the huge mechanism for sturdy but accurate performance.

The Arizona-California water rights controversy, described in full detail in Sam Morris's Conference paper (*see* p. 945 this issue), seems headed for further confusion. Just recently, following a successful application of dry-ice rain-making in Australia, water-thirsty Arizonans sent a transport airliner up to shoot dry-ice pellets at some cumulus clouds and succeeded in precipitating thousands of tons of water in the watershed of Roosevelt Dam, thus raising innumerable additional questions in the dispute at hand: Is unprecipitated water subject to the terms of the Colorado River Compact? Which way were the clouds heading when exploited? To whom does a cloudburst belong?

Your own interpretations or guesses will be as good as ours, but we cannot refrain from pointing out the possible political implications of the incident now that Boulder Dam has been renamed.

"Fighting Corrosion With Corrosion," a new booklet issued by the Electro Rust-Proofing Corp., Belleville, N.J., describes the application of cathodic protection to submerged steel structures. The booklet, which is available at the above address on request, includes an outline of the history and theory of cathodic protection and gives information about the design and operation of such systems.

(*Continued on page 62*)

ZECO GREENSAND ZEOLITE

ZECO and HI–ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

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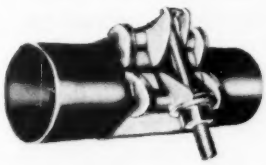

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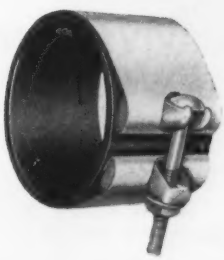
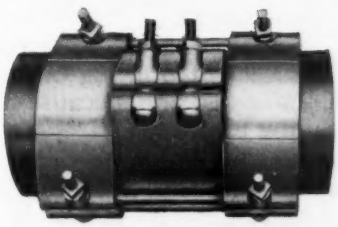


ADAMS BROKEN PIPE CLAMP



For Repairing Broken Cast Iron Pipe—— Positive Shut-Off Plus Rigid Pipe Support.

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(*Continued from page 60*)

Walter L. Picton is now a sanitary engineer on the staff of the Health and Sanitation Division of the Institute of Inter-American Affairs, assigned to work with the field party in Mexico. Previous to his connection with the Institute, Picton saw government service with the U.S. Public Health Service, the War Production Board, the National Resources Planning Board and, most recently, with the Program Requirements Branch of the National Housing Agency.

Flexo-Pac, a rubber packing material for use in yarning cast-iron pipe bell and spigot joints, is again on the market. Developed in 1939 and used extensively by many water utilities because of its ease of application and comparative freedom from bacteria, production was curtailed during the war years and has only just been resumed. It is available from the manufacturer, Rice-Chadwick Rubber Co., Killbuck, Ohio, in coil form, both wedge-shaped and round. It is claimed that Flexo-Pac simplifies installation by forming easily into rings and helping to center the spigot in the bell of the pipe. The cost per joint is said to be approximately the same as for braided jute.

(*Continued on page 64*)

SURVIVAL AND RETIREMENT EXPERIENCE WITH WATER WORKS FACILITIES

—a new A.W.W.A. book

576 pages, $3.00

Now ready for your library shelf is the compilation of the reports of the A.W.W.A. Committee on Survival and Retirement Experience With Water Works Facilities as published in the JOURNAL during 1945 and 1946, together with new data and 56 time-saving pages of Summary Tables.

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Here are the facts of life (and death) on the facilities of 26 American water works systems—large and small—public and private—serving almost 10 per cent of the 85 million U. S. water consumers and some 400,000 Canadians through every type of supply.

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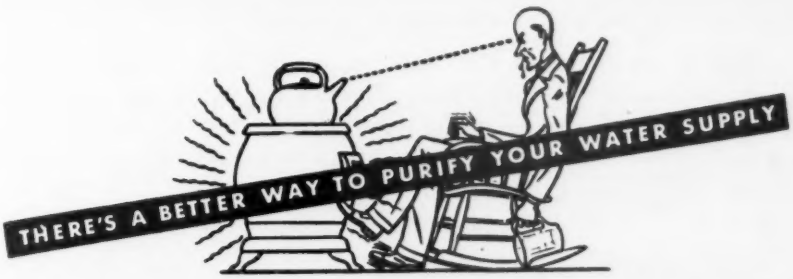

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Even if the watched kettle never boils you can have safe, pure water with %Proportioneers% Heavy Duty Chem-O-Feeder. This inexpensive, dependable chemical feeder will automatically purify up to a million gallons of water a day. Cross-connected to the starting switch of the main pump motor, the Chem-O-Feeder operates exactly in step with the pump and sterilizes every drop of water. It feeds just the right amount of hypochlorite or other chemical — eliminates the unpleasant taste resulting from overfeeding, and prevents dangerous undertreatment. Write for Bulletin SAN-2.

ADJUSTMENT WHILE IN MOTION. By simply turning a knob which varies the stroking length, the amount of chemical fed can be precisely adjusted—while the pump is operating.
CONTINUOUS FEEDING. Unique stroking arrangement gives long feeding stroke and short suction stroke — provides uniform distribution.
"SEE-THRU" PLASTIC REAGENT HEAD. Safely handles all water treating chemicals — shows the movement of the parts and the flow of liquid being fed.
PROVEN DESIGN. Over 24,000 %Proportioneers% units are in use all over the world.

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(*Continued from page 62*)

Slightly northeast of the "stiff upper lip" of shortage-stricken British water workers persists a reassuring twinkle. With water conservation high on the list of vital national purposes, the editors of the *Journal of the British Water Works Association* do not hesitate to tap the humor of the situation.

Pointing out that it is human nature to want cold water in summer weather and to waste a sufficient quantity from the tap to get it cold, they implore the London Metropolitan Board to be reasonable and not expect the English householder to drink his lemonade lukewarm just because he likes his beer that way. Warming up to the defense of thirsty consumers, they suggest that, since more ice means less water used, water undertakings should logically devote their energies to promoting the quick production of utility refrigerators or the installation of a system of central cooling. Then, bowing to the land of "strictly meteorological" V2 rockets and flying saucers, they hail the ingenuity of a nation which has carried conservation so far as to re-use the water in its ice cubes by putting it in a plastic case.

Whatever the calamities current now in England, we cannot seriously concur in the presently popular pronouncement of its death, at least until the twinkle is gone.

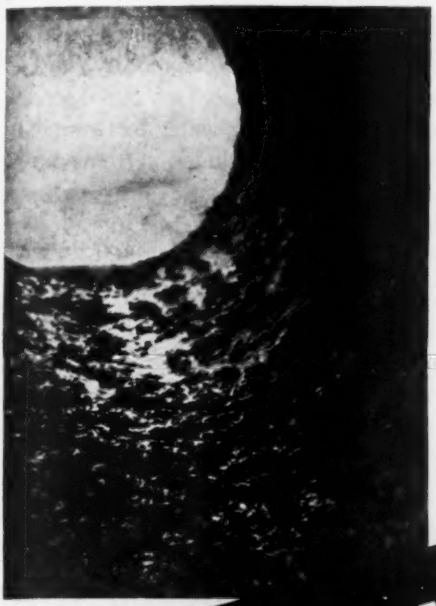
The effect of the war upon water supplies in Kansas is reflected in a survey conducted by the *Kansas Government Journal*. In the five-year period from 1941 to 1946, the number of customers of city-owned water utilities increased 10 per cent, consumption increased 26 per cent and revenues went up 31 per cent. The survey, which also covered city-owned electric and gas utilities, summarized reports from 364 water plants in the state.

George Erganian has recently joined the Div. of San. Eng. of the Indiana Board of Health and has been assigned to work on sewage and refuse disposal problems. A recipient of the master's degree in civil engineering from Purdue Univ. last June, Erganian had previously been working on piping design for hydroelectric projects with the Tennessee Valley Authority. He has also assisted in some studies, while working for his degree, on strawboard waste disposal.

Underpasses and service tunnels for a variety of uses are described in a 24-page illustrated manual issued by Armco Drainage and Metal Products, Inc., Middletown, Ohio. A variety of sizes and shapes of passageways and conduits are pictured and described in the manual, a limited supply of which is available from the home office, or from any division office or associated company.

(*Continued on page 66*)

▶ PIPE LINING FACTS NO. 1 ◀



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The ever-smooth, protective lining centrifugally applied by Centriline in some instances has increased carrying capacity beyond the rate of the pipeline when originally installed. This is due to the homogeneity of the lining which covers seams, joints and rivet heads.

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Cement Mortar Linings for Water Mains

Centrifugally Applied In Strict Conformity with A. W. W. A. Specifications

▶▶▶ WRITE TODAY FOR THE NEW CENTRILINE CATALOG

(*Continued from page 64*)

A sudden decrease in the number of public water supplies in New Jersey was the result, not of decreased demand for the commodity, but of a change in the legal definition. Chapter 295, P.L. 1946 of New Jersey defines a "public water supply" as a system distributing water to twenty or more customers; the old definition was broader and included systems serving eight or more dwellings.

The change has more than academic significance, for the jurisdiction of the State Dept. of Health is restricted to "public water supplies," and the result of the new ruling is to remove Health Dept. supervision and inspection from the smaller supplies. The ruling does not affect the authority of local boards of health, however, nor does it affect the quality of water used at public places.

Earnest Boyce, Prof. of Munic. & San. Eng. at the Univ. of Michigan College of Engineering, has been appointed chairman of the Civil Engineering Dept. Prof. Boyce, who is General Chairman of the Association's Committee on Watershed Protection and Maintenance, previously taught at the Univ. of Kansas and has also served as Chief Engr., Div. of San. of the Kansas Board of Health and as Sr. Engr. with the U.S. Public Health Service.

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NEWS OF THE FIELD

Research is on the boom—not only that promoted and subsidized by the federal government, but all research. Industry is spending 450 million dollars per year now in contrast to the 80 million in expenditures it averaged during the 1941–1945 period. Universities and other research organizations have upped their expenses to 85 million dollars from a wartime average of 20 million. But the government's part in the boom has been the biggest, increasing its share in the support of research from approximately 20 per cent before the war to more than 50 per cent now, with plans to boost that percentage considerably by doubling its present spendings in the next ten years.

Currently federal research expenditures stand at about 625 million dollars, distributed among 60 agencies. Approximately 30,000 scientists work directly for the government, operating government research facilities, which, exclusive of atomic development and production projects, are valued at 1½ billion dollars. And direct government projects eat up only about a third of the total research budget, the remaining portion being channeled through industrial and educational research facilities. All in all, it appears that research is slated for a position in the federal structure equal to that traditionally held by national defense—and well it merits it.

Both the cost of this boom and the spending involved are bound to have a tremendous effect upon our economy. It will be the taxpayer who foots the bill for research, but it will be the taxpayer too who will stand to reap the largest harvest of technological gains. And the huge sums channeled through industry and educational institutions should have a beneficial effect upon their operations.

What still remains to be done to give the entire program direction is the establishment of a unified federal policy on scientific research and support of science. The National Science Foundation authorized by the last Congress failed to win the approval of the President, but further attempts to reach agreement will undoubtedly be made during the next session. At present the Bureau of the Budget, the Joint Research and Development Board of the national military establishment and the National Academy of Sciences do act to establish government research policy, but one coordinating agency, led by a man of vision, integrity and knowledge, is a prime necessity.

Only through a wise administration of the entire program can the proposed expansion be accomplished on a sound footing. More researchers

(Continued on page 2)

(*Continued from page 1*)

will be needed and positive steps will have to be taken to assure an adequate supply of properly trained scientists with the proper personal qualifications demanded by research. Basic and developmental projects will have to be kept in proper balance to satisfy the American public's demand for results while assuring a continuation of the unglamorous scientific drudgery that will eventually produce results. And present public support must be held at all costs, so that depression economies will not strike at the vitals of a program that must be continued to be worth while.

Hoover Dam is the name being given to a dam planned by the city of Columbus, Ohio, not in emulation of the Colorado dam of the same name, but in honor of brothers Charles P. and Clarence B. Hoover, who have devoted their lives to the city's water supply. This tribute to the two veteran water men—Charles, Chief Chemist of the Filtration Plant, with 39 years of service behind him, and Clarence, Supt. of the Div. of Water, with 43 years of service—was announced by Mayor James A. Rhodes at the A.W.W.A. Ohio Section Meeting on September 30.

The proposed reservoir, which will result from the damming of Walnut Creek, is designed to increase the city's water supply by 26 mgd. It was recommended by the City Planning Commission after many years of study by Supt. Hoover and realizes his dream of adding a second watershed to the city's supply system.

Such recognition by the city they served so long and so well must be considered especially appropriate in view of the faithful service the brothers have rendered, not only to Columbus but to the rest of the world, both in the leadership and example furnished by brother Clarence and in the careful research and many contributions to water works literature (which JOURNAL readers will recall seeing in these pages) by brother Charles. It is indeed heart-warming to see that some things are for the best in this not quite "best of all possible worlds."

"Hire the Handicapped—It's Good Business" was the slogan for the third annual observance throughout the nation of Employ the Physically Handicapped Week, October 5–11. Studies conducted by the Bureau of Labor Statistics of the U.S. Dept. of Labor indicate that, in a large variety of industries, impaired workers, as a group, produce at slightly higher rates than unimpaired workers on the same jobs, while accident, absentee and quitting rates were the same for both groups. In addition, the incidence of disabling accidents is lower among the handicapped group. All State Employment Services are co-operating actively in the placement of the physically handicapped, utilizing their selective placement technique to match job requirements with the unimpaired abilities of the partially disabled.

(*Continued on page 4*)

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(*Continued from page 2*)

Heavy engineering construction costs, according to a survey made by the Associated General Contractors of America in September, are remaining steady in many areas, although half of the replies indicated slight cost increases. In building and highway construction, continuation of a slight upward cost trend was more definitely indicated. The comparative trend of costs seemed to reverse that taken by the volume of construction, in which the greatest increases were shown in the heavy engineering projects, such as dams and earthmoving activities. Material shortages seemed generally to vary with the trend of costs.

These findings of increases in heavy engineering activity were also borne out by figures of the F. W. Dodge Corp., a fact-finding organization for the construction industry. Public works and utilities contracts in August showed gains of 35 per cent over July and 21 per cent over August of 1946, compared to an over-all gain for residential, nonresidential and public works and utilities contracts of 25 and 21 per cent for those months. It was considered particularly significant that the August total should be over $823,000,000 greater than the total for July or for June, thus establishing an unusually heavy contraseasonal upward trend.

(*Continued on page 6*)

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is an excellent plating medium recommended for direct counts of coliform bacteria in water. This medium conforms to the formula of Noble and Tonney as described in "Standard Methods of Water Analysis" 1936. After incubation for 18 hours at 37°C. typical colonies of coliform types are deep red and are surrounded by a pink halo.

BACTO-VIOLET RED BILE AGAR

is a recommended medium for direct plate counts of the coliform organisms in water. On plates of this medium the coliform types produce red colonies surrounded by a reddish zone of precipitated bile. Counts are made after incubation at 37°C. for 18 hours.

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Its spun enamel lining prevents tuberculation, makes for highest possible flow capacity. Tight joints are assured with any standard type coupling or by field welding.

Diameters of ARMCO Steel Pipe run from 6 to 36 inches, wall thicknesses from 7/64 to ½ inch. Write us. Armco Drainage & Metal Products, Inc., Pipe Sales Division, 1205 Curtis Street, Middletown, Ohio.

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ARMCO

ARMCO STEEL PIPE

MEETS A. W. W. A. SPECIFICATIONS

(*Continued from page 4*)

The modern nose being what it is, science and industry are spending an increasing amount of time and effort in developing materials to disguise or dispel all odors which may conceivably be offensive to that ever more sensitive organ of intrusion. And now in Hyamine 1622, the quaternary ammonium compound developed by Rohm and Haas Co. as a germicide and applied to the sterilization of jute-packed mains by JOURNAL authors Sotier and Ward (*see* October issue, p. 1038), we discover that we have a deodorant which destroys odors rather than merely concealing or masking them. Reports indicate that the new material is finding widespread use in eliminating odors at the source—in large manufacturing plants, around garbage dumps and in polluted streams. Pointing out that the compound is odorless and, at use-dilutions, harmless to people and animals, the manufacturers claim it to be effective in eliminating any kind of bacteria-induced putrefaction, destroying the characteristic scent of such odoriferous materials as garlic, onions, spoiled potatoes and decayed fish.

We agree that this is another—at least minor—milestone in the progress of science. We agree, of course, that the world can well dispense with many of the odors now emanating from it. But we cannot help but be concerned with the idea of an odorless world—and odorless it will be if all the smells objectionable to any of its inhabitants are summarily destroyed. Remote as the possibility may now seem, we are still idealists enough to expect some day again to eat just one more juicy steak smothered in onions —and when we do, we want to enjoy to the full the aroma of its preparation.

Following the connotations of the above announcement to their logical conclusions, we foresee the end of many present pleasures. Destroy odors at their source and Jersey's flats or Chicago's packing plant district will be indistinguishable from Iowa's cornfields or California's orange groves. Destroy the stench of bacteria-induced putrefaction and we will unwittingly sit down to a feast of spoiled potatoes and decayed fish. Remove all scents and our noses will soon shrink to the status of vestigial organs, used solely to support our spectacles.

It is a dog's life that we're heading for—literally a dog's life, for the canine world has long since thrown up its paws in dismay. What with the increasing use of such disguisers as "Chanel No. 5," "One Careless Night" and "Aqua Velva" and such dispellers as "Mum," "Arrid" and "Odorono," it's a good dog now who knows his own master—even at second sniff.

Ray L. Derby, San. Engr. of the Los Angeles Dept. of Water and Power, has been appointed to the position of Principal Water Works Engr., which carries with it the leadership of the San. Eng. Div.

(*Continued on page 8*)

A mighty expensive piece of pipe *in any water system*

This piece of clogged pipe, taken from a water main, was the cause of high pumping costs, low pressures, and inadequate water supply.

Since 1906 National Water Main Cleaning Co. has corrected many serious pipeline conditions. These involved the removal of hard incrustation, serious tuberculation, obstructions, sediment and debris of all kinds in water mains of all types and sizes. Any main can be restored by National to at least 95% of its original capacity.

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(*Continued from page 6*)

Soil mechanics experts at the Northwestern Univ. Technological Inst., Evanston, Ill., have developed a new method for determining the strengths of clay subsoils, which, it is claimed, can make possible the saving of $50,000,000 a year to the construction industry in the United States.

The device, a pore water pressure instrument, employs a specimen of clay measuring 1 × 3 in., enclosed in a rubber membrane and surrounded by 1.5 gal. of castor oil. A hypodermic needle is inserted in the clay and the resulting pressures are recorded through two photoelectric cells on a clock-operated, automatic disk recorder. It is from this record that important data can be used in establishing the theory for predicting the probable settlement of structures built on clay subsoils. Castor oil is used because, in addition to lubricating the device, it has no affinity to water and prevents an osmotic flow through the rubber membrane.

The designers of the instrument—Profs. P. C. Rutledge and J. O. Osterberg, along with T. W. Van Zelst, a graduate research assistant—observe that today there are more earth dams than concrete because many are constructed in locations where masonry dams cannot be built. Every bit of knowledge which engineers acquire about clays will enable them to design and construct earth dams and buildings more economically. In addition, there need be no fear of such disasters as that at Fort Peck, Mont., in 1938. Such failures in earth dams, it was pointed out, could cause the loss of millions of dollars and many lives. Other uses for the pore water pressure instrument could be in the building of better levees along rivers, thus aiding the nation's flood control program, and the avoidance of costly damage to buildings which have settled, such as cracked walls and broken plaster and brittle facing materials on building exteriors. Buildings in such cities as Chicago, New Orleans, Boston, Cleveland and Detroit have settled as much as 2 ft. in the subsoil on which they were erected, it was said, while in Mexico City buildings have sunk as much as 6 or 7 ft., with costly consequences.

(*Continued on page 10*)

MACHINE BLENDED

BOND-O

A dependable self-calking joint compound for cast-iron bell and spigot water mains.

Used by hundreds of water companies, water departments and water works contractors.

NORTHROP & COMPANY, INC.

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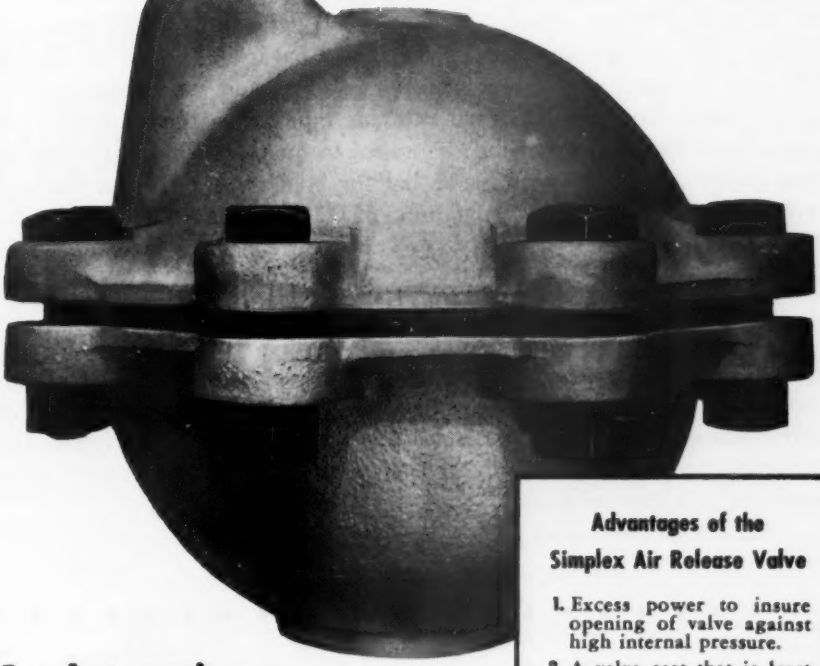
AIR RELEASE VALVES



For Automatic, Periodic Release of Air Accumulations in Pipe Lines

Whenever water is forced through pipe lines, under pressure, air in suspension is carried with it.

When air accumulations collect in high points in the line, the usable cross section area of the pipe is reduced and induces a friction factor—lowering the pumping capacity of the entire line.

Simplex air release valves are designed specifically to overcome these conditions and to provide for automatic and frequent release of air accumulations in pipe lines. For full information write to the Simplex Valve and Meter Co., 6784 Upland St., Philadelphia 42, Pa.

Advantages of the Simplex Air Release Valve

1. Excess power to insure opening of valve against high internal pressure.
2. A valve seat that is least liable to stick shut or leak water.
3. A non-corrodible float that will not collapse or become disconnected from its lever.
4. Simplicity of construction, easy bearings and few parts.
5. Properly designed outlet port to prevent clogging by deposits of any kind.
6. Provision for draining without dismantling valve.
7. Sturdy construction, permitting rough handling.
8. Easy inspection of internal parts.

Ask for Bulletin 140.

SIMPLEX

VALVE AND METER COMPANY

(*Continued from page 8*)

An appeal to the President to declare that a state of emergency exists was made by the city of Winston-Salem, N.C., in an effort to obtain the equipment needed to relieve the worst water shortage in its history. City officials, who are accused by the local Engineers' Club of ignoring warnings that storage was "inadequate" and "hazardous" back in March, 1946, now are faced with a supply in the city reservoir that is expected to last only until Nov. 21 at normal rates of rainfall and consumption. A proposal that $4,000,000 of bonds be issued to finance permanent improvements in the supply has been made, but for immediate assistance the city is requesting War Dept. aid in obtaining 35,000 ft. of 12-in. pipe to supplement the reservoir intake capacity. Severe conservation measures have also been taken by consumers and industrial users.

Kenneth E. Damann, formerly Biologist with the Water Purif. Div. of Chicago's South Dist. Filtration Plant, is now organizing a Microbiology Dept. at Eastern Illinois State College. Damann's previous major interest was in the periodicity of plankton organisms in Lake Michigan, and in his new position he is continuing his research on the relation of these organisms to water treatment.

(*Continued on page 12*)

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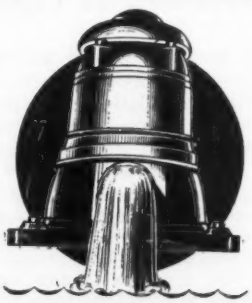
PLANNING SERVICE IS AT NO COST

Layne Engineers are always glad to co-operate with city officials on any ground water development plan. These Engineers go into your water supply needs completely and then, at no cost or obligation to you, make recommendations of great value. If you wish this co-operation, simply address LAYNE & BOWLER, INC., General Offices Memphis 8, Tenn.



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GRAVIMETRIC FEEDERS

For exact chemical feeding install OMEGA Gravimetric Feeders! They continuously weigh any dry material on sensitive scales and deliver exactly the amount per hour required, in accordance with the rate preset — over a 100 to 1 range. OMEGA Dust Removers are available to insure dust-free operation: dusty air is drawn through filter bags and the collected dust falls into the feed hopper — without waste. Automatic proportioning controls and alarm devices can also be furnished.

BELT-TYPE GRAVIMETRIC FEEDER

Material is continuously weighed on short conveyor belt carried on sensitive scales. Widely used with OMEGA Lime Slakers. Feeding accuracy 2% or better, capacity to 10,000 lbs. per hr.

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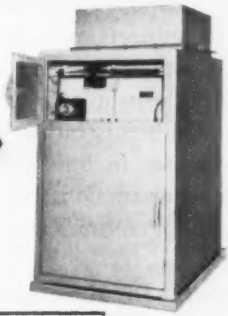
has hopper mounted on sensitive scales. Feeds any dry material, ½ to 5000 lbs. per hr., with accuracy of 1% or better.



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(*Continued from page 10*)

Fundamental curriculum changes in civil engineering, described as a major advance in engineering education, were announced at the Massachusetts Institute of Technology, where they became effective beginning with the current academic year. The changes are based on an exhaustive two-year study made by the institute's Dept. of Civil and San. Eng. in consultation with a number of leading engineers.

The three functional phases of engineering projects—conception, design and construction—provide the basis for the changes, which consist essentially of three options offered to the student in the middle of his third year, after he has taken the usual basic courses in humanities, mathematics, science, mechanics and surveying.

Corresponding to the conception phase is the planning and administration option, which is intended not only for those inclined to specialize in these aspects of engineering work but also as a general course in civil engineering. Interest in the second, or design phase, is met by the theory and design option, which prepares men of outstanding technical promise for design, research, teaching and graduate work in either civil or sanitary engineering. The requirements of the third phase, construction, are met by the construction and management option, which prepares men for the supervision of engineering construction of all types, and for the field of contracting.

It is pointed out that a proper choice of option and electives adapts the new curriculum to the needs of students who are primarily interested in sanitary engineering, which is closely related to civil engineering. Much of the work in sanitary engineering at M.I.T., however, is conducted at the graduate level.

The functional approach makes it possible to offer students a variety of important subjects not previously included in their program. Students electing the planning and administration option, for example, will be able to study the principles of conservation, urban sociology and planning legislation and administration. The theory and design option will offer advanced courses in fluid mechanics, soil mechanics and structural theory; while the construction and management option will make available courses in accounting, contract law and business management.

Robert L. Hardman has been appointed Chief Engr. of the National Water Main Cleaning Co. A graduate of the Univ. of Iowa, with a B.S. degree in Civ. Eng., Hardman worked on the survey for the Moffat Water Tunnel Project at Denver, Colo., and spent a number of years in the Canal Zone and Central America. During the war he served with the Corps of Engrs., joining his present firm after his discharge slightly over a year ago.

(*Continued on page 14*)

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Builds the Pump You Require...in Vertical and Horizontal Types

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DRIVES: ELECTRIC AND OTHER TYPES

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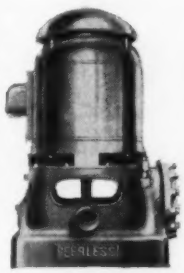
OIL OR WATER LUBRICATED TYPES

Peerless Vertical Turbine Pumps complement the extensive Peerless Centrifugal Pump line and are adaptable to the widest pumping conditions. Peerless' vertical type pump line includes turbine pumps, propeller and mixed flow pumps, Hi-Lift pumps and domestic water systems for deep or shallow wells. REQUEST BULLETIN.



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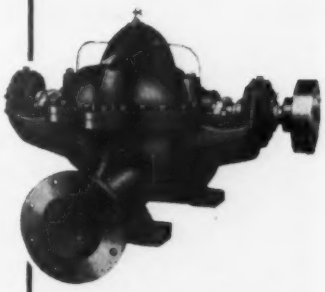
General Specifications:

Capacities, from 15 to 30,000 g.p.m.; *Lifts*, to 1000 feet; *Drives*, electric, gear, belt or combinations. For wells 4" inside diameter and larger. Embodies patented Double-Bearing and Double-Seal Bowl construction.



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General Specifications: *Capacities*, from 50 to 70,000 g.p.m.; *Heads*, 15 to 300 feet; *Sizes*, 2" to 42" discharge; *Drives*, electric and other types from 1 to 1000 h.p.; *Type*, single stage, double suction, split-case, ball bearing. REQUEST DESCRIPTIVE BULLETIN.

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(*Continued from page 12*)

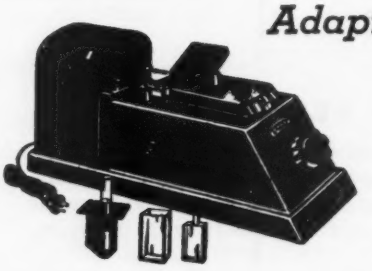
Philip B. Streander, Cons. Engr., is planning to open an office in New York City this winter. The new office will extend the coverage of Philip B. Streander and Affiliates, Cons. Engrs., throughout New England and the Middle Atlantic States. Streander has served as Consultant with the Stone and Webster Eng. Corp. in Boston, working on many water supply and sewerage projects for war plants, and also has been associated with George L. Watson in New York, doing sanitary engineering.

Philip H. Beauvais, who as City Mgr. and City Engr. served Alma, Mich., since 1943, has been appointed City Mgr. of Allegan, Mich. Previously Beauvais had been City Mgr. of Manistee (1918-21), Royal Oak (1921–25), and Manistique, Mich.

Frederick S. Kent, until recently Director of the housing survey conducted in Battle Creek, Mich., is now studying for his master's degree in Public Health at the Univ. of Michigan. Previously Kent has been Asst. Instructor in Civ. Eng. at New York Univ., Asst. San. Engr. with the W. K. Kellogg Foundation, Battle Creek, Mich., and Supt. of Water Purif. at the Panama Canal.

(*Continued on page 16*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER



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Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

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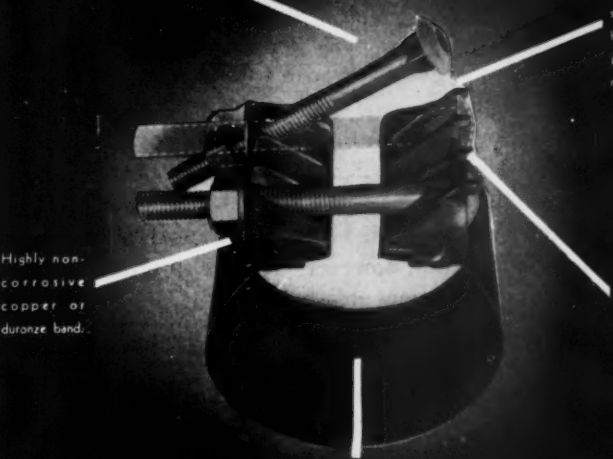
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Manganese bronze slotted lugs permit bolts to drop into place without removing nuts.
Highly non-corrosive copper or duronze band.
Lug points hold bolts in position when tightening.
High quality pressure-tight, soft neoprene rubber gasket.

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(*Continued from page 14*)

Hold That Line, an autumnal exhortation which for years has meant just one thing, recently entered the water works glossary as a newly necessary term. The etymological extension occurred as the result of some large-diameter larceny in the Borough of Shenandoah, Schuylkill County, Pa.

Some months ago, when borough officials attempted to cut in a reserve supply through a 1,235-ft. pipeline, installed for emergency service during dry spells, nothing happened. A hurried check revealed the startling fact that the line was no longer there. Police investigators, presented with the puzzle, were able to determine that the unprecedented disappearance had been accomplished over a 25-day period, during which the pipe was dug up and removed, section by section, and the trench filled in the approved manner. Pursuing the inquiry, the local constabulary soon arrested six ingenious young men and charged them with having sold the missing main to unquestioning junk dealers.

Estimating that replacement of the line would cost the borough at least $15,000, the borough solicitor will undoubtedly give serious consideration to the purchase of burglary insurance not only for all water works facilities but for the borough hall itself. Since insurance policies make poor transmission or distribution lines, however, we look to water works executives to give their personnel prompt pep-talks on the need to "Hold That Line."

"Functional Design of Laboratory Glassware" is the subject of an article in the fall issue of *The Announcer of Scientific Equipment,* publication of Eberbach & Son Co., Ann Arbor, Mich. The advantages of glazed rather than ground rims on Petri dishes, of graduated cylinders with heavy, non-tip bases—in hexagonal form, to prevent rolling if they should tip, and with a corner of the base aligned with the pouring lip, to prevent an overturned cylinder from striking the lip—are all described and illustrated. The current and future issues are available upon request to the company at the above address.

A new float switch, manufactured by the Automatic Control Co., has been announced. Known as the L–200 Float Switch, the device is a sturdy, two-pole, double-break, snap-back switch with silver-to-silver contacts. The operating mechanism is housed in a 16-gage, drip-proof case for dependability. Reversal of a lever arm changes the contact operation from "make" on rising level and "break" on lowering, to the reverse. The mechanism is also available with a float and other accessories in the LP–200 model as a completely packaged unit ready to install. Both units are described in Bulletin L–3, which may be obtained from the Automatic Control Co., 1003 University Ave., St. Paul 4, Minn.

(*Continued on page 18*)

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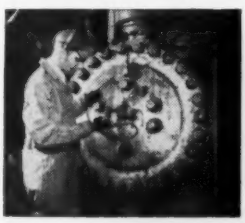
Increase water well production—the chemical way!

Treatment results in Dowell files list many production increases secured through proper chemical treatment of water wells. Chemical removal of retarding incrustations on screens, tubing and pump equipment and enlargement of formation pores permit production of more water—faster!

Dowell pioneered well-acidizing. Its engineers have the know-how based on experience gained in treating thousands of oil, gas and water wells. Call nearest Dowell office for free estimate. Ask also about Dowell chemical scale removal service for water lines, steam generating and heat exchange equipment.

Dowell's industrial engineers are selected for experience and ability—trained in the field and in the laboratory. Dowell's field equipment is scientifically designed to control, step-by-step, the complete scale removal process.



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(*Continued from page 16*)

Ray F. Goudey, San. Engr., has joined the staff of Truesdail Laboratories, Inc., Chemists, Bacteriologists and Engrs. of Los Angeles, and will direct the firm's newly organized San. Eng. Div.

Sol Pincus, Sr. San. Engr., has retired from the New York City Dept. of Health. Immediately he intends to spend his well-earned rest catching up with "a little writing, much reading and some country loafing." Eventually he intends to return to some phase of public health work.

A 164-page book, "Taste and Odor Control in Water Purification," has been published and is available for distribution from the Industrial Chemical Sales Div. of the West Virginia Pulp & Paper Co., 230 Park Ave., New York 17, N.Y. The book deals mainly with a discussion of taste and odor control by the use of activated carbon, although other methods of control are also discussed. The well-illustrated chapters, written by various authorities in the field, deal with such subjects as the threshold odor test; the effect of treatment processes on tastes and odors; the storage, handling and dosage of activated carbon; and the application of chlorine, chlorine-ammonia, chlorine dioxide and ozone.

(*Continued on page 20*)

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Ferri-Floc is a partially hydrated ferric-sulfate that gives lower operating cost. Ferri-Floc is readily soluble in coldest water, gives off no corrosive fumes in warmer water, making fans on solution pot entirely unnecessary. It does not pass through a gummy stage going into solution and can be stored in open bins for indefinite periods of time.

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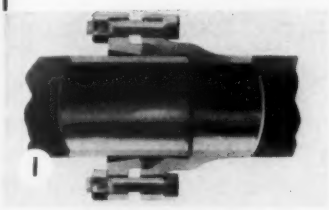
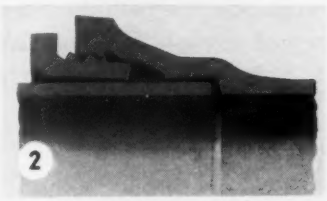
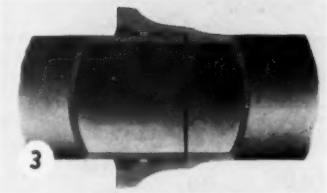


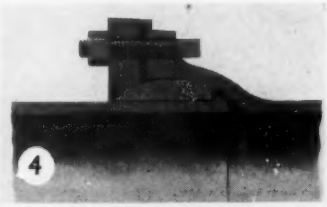
1. DOUBLEX SIMPLEX JOINT PIPE—A standardized mechanical joint pipe equipped with stuffing box type of joint having a ring gasket, cast iron gland, and cast iron bolts. Scientifically designed to meet the exacting requirements of low, medium and high-pressure service in handling gas and liquids.



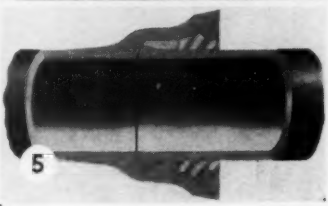
2. SCREW-GLAND JOINT PIPE—An all-purpose economical, mechanical joint pipe suitable for water, gas, oil and other fluids, developed in answer to the demand for a rubber-packed joint without bolts suitable for normal service and pressure conditions.



3. ROLL-ON-RUBBER RING JOINT PIPE—Designed as an alternate for bell and spigot pipe for conveyance of water, sewage or similar liquids. It is quickly and easily assembled by unskilled labor and after assembly the joint will easily deflect and remain tight under pressure.



4. MOLOX BALL AND SOCKET JOINT PIPE—An exclusive Acipco development, designed for river crossings and other installations requiring excessive joint deflection. It remains bottle tight under pressures up to several hundred pounds per square inch.



5. STANDARD BELL AND SPIGOT PIPE—Used under normal service conditions, the standard bell and spigot joint gives long and dependable service. It is supplied in diameters 3″ through 48″ inclusive.

AMERICAN CAST IRON PIPE COMPANY

Birmingham 2, Alabama

(*Continued from page 18*)

Negotiation of an agreement which provides the Belco Industrial Equipment Div. of Bogue Industries, Paterson, N.J., with direct sales and service representation in 26 additional states, and which brings the Deady Chemical Co., Kansas City, Mo., into the field of mechanical water treatment, was announced jointly by the presidents of the two companies.

The agreement permits the Deady organization, which previously had confined its activities to compounding special formulas for chemical treatment of water, to handle the entire range of Belco water treatment equipment in the western, midwestern and southwestern states in which it maintains sales and service engineers.

The A. M. Byers Co., Pittsburgh, manufacturers of wrought-iron pipe and plate, announce the appointment of Paul S. Park as Manager, Engineering Service Dept. Park, a graduate in mechanical engineering of the Univ. of Pittsburgh, has been with the company nearly four years. The department he is to head deals with the use of wrought iron in many fields, including water supply, and has been active in the development of radiant heating and snow melting systems.

(*Continued on page 22*)

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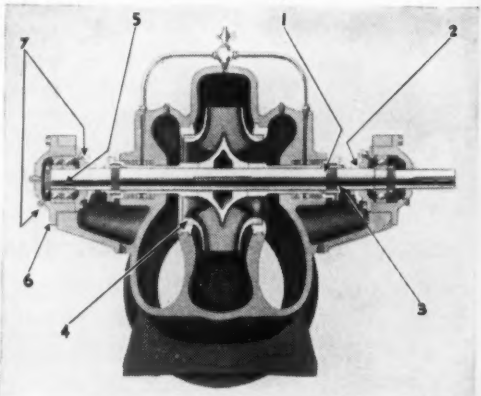

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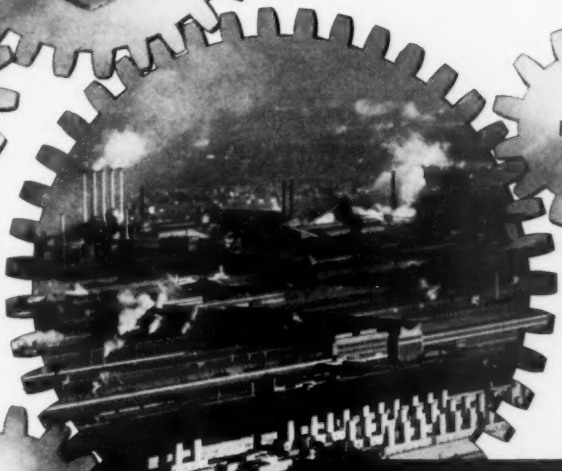

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(*Continued from page 20*)

Control valves are the subject of a 36-page bulletin just brought up to date and reissued by the Foxboro Co., Foxboro, Mass. The bulletin, which is entitled "Pneumatic Control Valves and Controller Accessories," contains plates and tables of specifications for control valves, needle-type valves, poppet valves and butterfly valves, as well as information on air switches and sub-panels for remote control. Tables and formulas to be used in computing the correct size of valves for a contemplated installation are also furnished, in addition to much material on air filter sets, ventilating dampers and other accessory equipment. There is also a color page showing the various identifying enamel finishes offered on Stabilflo Valves, corresponding to the color code of the ASA. Copies will be sent to those requesting Bul. *277–2* from the company at the above address.

Edwin Day Burchard, District Engr. for the U.S. Geological Survey in charge of surface water investigations in North Carolina, is retiring after 23 years of service. In addition, George E. Ferguson, who held a similar position at Ocala, Fla., has been transferred to a staff position at the Washington office.

(*Continued on page 44*)

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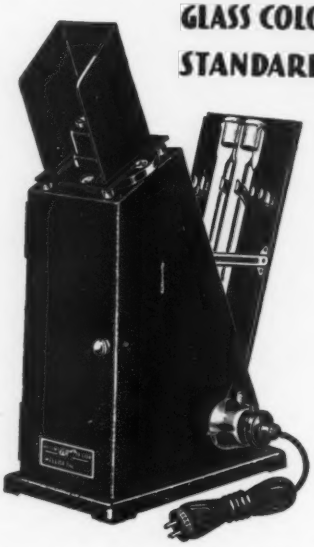

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CHANGES IN MEMBERSHIP

NEW MEMBERS

Applications received September 1 to 30, 1947

Anderson, William I., Chief Accountant, Water Dept., 323 County City Bldg., Seattle 4, Wash. (Oct. '47)

Angelotti, Tony, Supt., Water Dept., 9—2nd St., Willoughby, Ohio (Oct. '47)

Arbulu M., Jose, San Engr., Ministry of Public Works, 180 Pablo Bermudez, Lima, Peru (Oct. '47)

Arnold, David L., Gen. Foreman, Water Works, 1540 Miami Court, N.E., Canton, Ohio (Oct. '47)

Avon Lake Water Dept., Paul McCampbell, Board of Trustees of Public Affairs, 33370 Lake Rd., Avon Lake, Ohio (Corp. M. Oct. '47)

Bahamonde, H. O. M., Sub-Director de Agua Potable, Dept. de Agua de Quito, Ave. Rio de Janeiro No. 726, Quito, Ecuador (Oct. '47)

Bankston, Leo V., Asst. Engr., Baton Rouge Water Works Co., 131 Lafayette St., Baton Rouge, La. (July '47)

Bayless, John H., Engr., Water Dept., Chagrin Falls, Ohio (July '47)

Bidlack, Floyd E., Munic. Water Works, 16 Wright St., Willoughby, Ohio (Oct. '47)

Black, C. S., Supt., Water Works, 321 E. Somerset, Eaton, Ohio (Oct. '47)

(Continued on page 30)

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(*Continued from page 28*)

Brady, E. J., Maint. Supt., Div. of Water, 45 Richmond Ave., Buffalo 13, N.Y. (Oct. '47)

Brown, Richard F., Chief Chemist, Dept. of Water Works, Evansville, Ind. (Oct. '47)

Burbank, Roberto B., San. Engr., Ministry of Public Works, Calle Francis 329, Mira Flores, Lima, Peru (Oct. '47)

Burdick, Roy, Cons. Engr., Lunn & Burdick, 316 Cambridge, Grand Forks, N.D. (Oct. '47)

Cameron, Alwyn J., San. Engr., Dept. of Health, Fredericton, N.B., Can. (Oct. '47)

Choza, Fernando, San. Engr., Ministry of Public Works, 355 Ave. Arequipa, Mira Flores, Lima, Peru (Oct. '47)

Connor, John W., Constr. Engr., International Water Co., Apdo. 630, Quito, Ecuador (Oct. '47)

Cox, Rupert L., Chemist, E. I. du Pont de Nemours & Co., 3417 Kensington Ave., Richmond 21, Va. (Oct. '47)

Cumitz, George R., Supervisor, F. G. Browne & Assocs., 196 S. Main St., Marion, Ohio (Oct. '47)

Dawson, Richard H., Sales Engr., Denver Fire Clay Co., 2201 Blake St., Denver, Colo. (July '47)

Dawson V., Harry D., San Engr., Ministry of Public Works, Angaraes 873, Lima, Peru (Oct. '47)

Decker, L. D., Supt. of Water, 1 W. Main St., Ashland, Ohio (July '47)

Dobkiewicz, Hedwig M. (Miss), Chemist, Penna. Sugar Co., 1037 N. Delaware Ave., Philadelphia 25, Pa. (July '47)

Donovan, Frederick H., Acting Supt., International Water Co., Apdo. 630, Quito, Ecuador (Oct. '47)

Drager, W. C., City Mgr., Box 145, Williamsburg, Va. (July '47)

Ellsworth, Robert B., Tech. Supervisor, Wm. Lynn Chemical Co., Inc., 125 N. Davidson St., Indianapolis 2, Ind. (Oct. '47)

Emerick, C. M., Supervisor of Distr., Water Works, 1220 W. 21st St., Lorain, Ohio (Oct. '47)

Emporia, City of, Walter F. Johnson, City Mgr., City Hall, Emporia, Kan. (Corp. M. Oct. '47)

(*Continued on page 32*)

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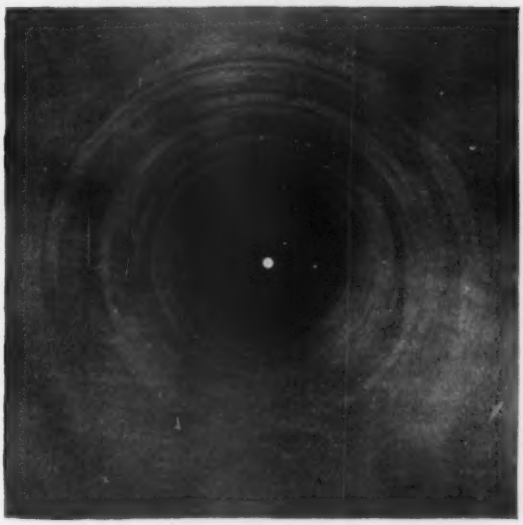

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(*Continued from page 30*)

Ey, L. F., Chief, Div. of Labs., State Dept. of Health, Ohio State Univ. Campus, Columbus 10, Ohio (July '47)

Farnsworth, K. A., Operator, Water Works, R.F.D. No. 3, Wellington, Ohio (Oct. '47)

Frederickson, A. Anton, Pres., City Utilities Co., Pima, Ariz. (July '47)

Freeman, William B., Dist. Mgr., Lock Joint Pipe Co., 1716 California St., Denver 2, Colo. (Oct. '47)

Gardner, Lyle W., Supt., Water Dept., Mt. Morris, Mich. (Oct. '47)

Glass, Harry J., Mfrs. Repr., Economy Pumps, Inc., Box 1484, Colorado Springs, Colo. (Oct. '47)

Glueck, Frank J., San Engr., Henkels & McCoy, Contractors, 1504 E. Cliveden St., Philadelphia 19, Pa. (Oct. '47)

Goodfellow, E. J., Village Treas., Municipal Bldg., Manlius, N.Y. (July '47)

Goodhue, D. J., Mgr., Munic. Utilities, 14 E. 5th St., La Junta, Colo. (Oct. '47)

Granger, Dale W., *see* Landel Metropolitan Dist.

Green, O. R., Supt., Water Dept., 7th & Pine Sts., Pittsburg, Kan. (Oct. '47)

Hageman, F. Marion, Director of Service & Safety, Munic. Water Works, St. Marys, Ohio (Oct. '47)

Hall, Raymond E., San. Engr., Lucas County, Court House, Toledo 2, Ohio (Oct. '47)

Heck, Charles D., Chief Clerk, Water Div., City Hall, Columbus 15, Ohio (Oct. '47)

Hendrickson, William A., Gen. Mgr., Ellis & Ford Mfg. Co., 2433 Goodrich Ave., Ferndale, Mich. (July '47)

Hill, John L., Chief Water Works Engr., F.C.A.B., Antofagasta, Chile (Oct. '47)

Hyndshaw, Albert Y., Research Chemist, Industrial Chemical Sales Div., West Virginia Pulp & Paper Co., Tyrone, Pa. (Oct. '47)

Johnson, Kiehner, Johns-Manville Sales Corp., 12 N. 3rd St., Columbus, Ohio (Oct. '47)

Johnson, Walter F., *see* Emporia, City of

Kuhn, Paul G., Chief Operator, Water Dept., 151 Whittlesey Ave., Norwalk, Ohio (Oct. '47)

(*Continued on page 34*)

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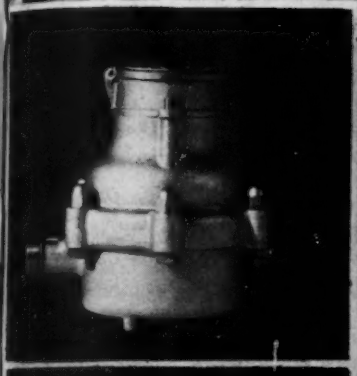

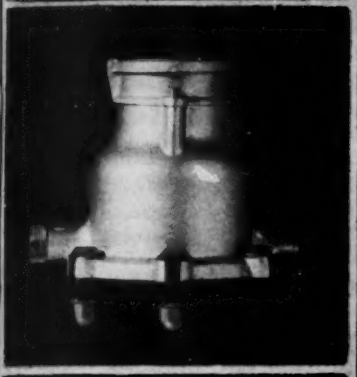

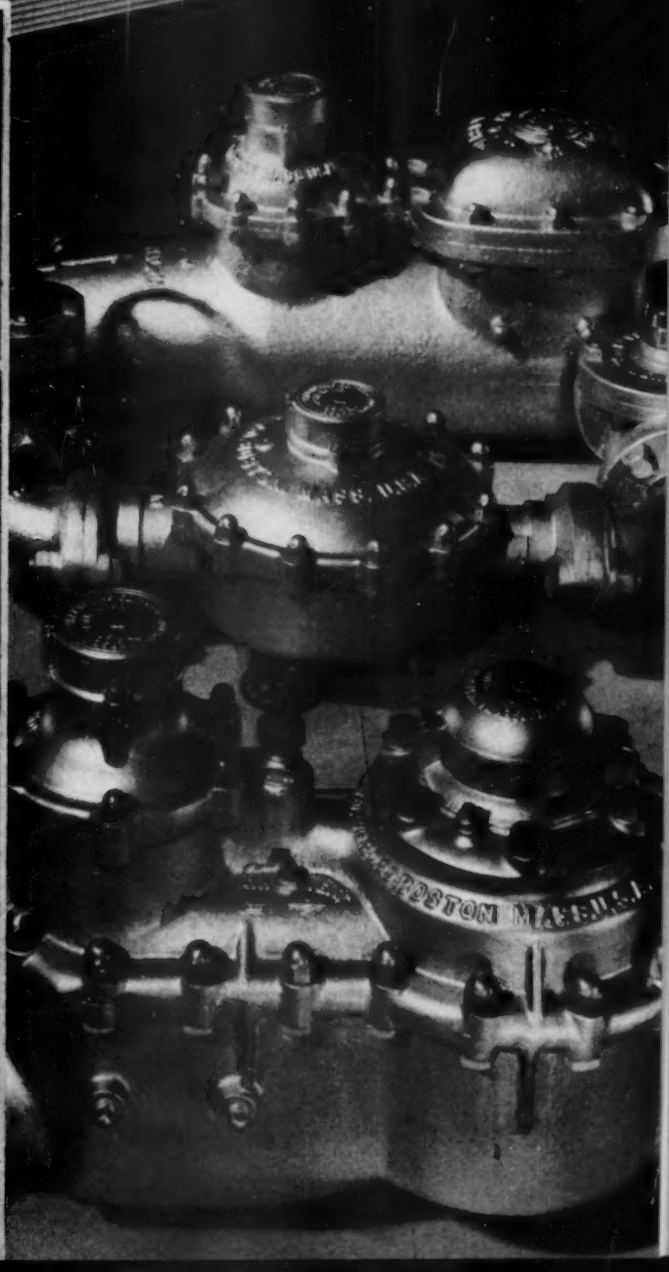

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Labore, Stanley, Asst. Supt., Munic. Utilities, La Junta, Colo. (Oct. '47)

Laine, Gilbert J., Supt., Dept. of Water Works, Evansville, Ind. (Oct. '47)

Lamontine, E. E., Supt., Water Dept., 503 Texas, Carlsbad, N.M. (Oct. '47)

Landel Metropolitan Dist., Dale W. Granger, Dist. Engr., 124 S. Detroit St., Lansing, Mich. (Corp. M. July '47)

Laurence, Daniel C., Supt., Commercial Div., Water Works, 142 City Hall, Cincinnati 2, Ohio (Oct. '47)

Lemon, Paul H., Supt., Water & Sewer Div., Dept. of Public Works, 641 S. Water St., Saginaw, Mich. (Oct. '47)

Lorah, John C., Supt., Water Works, Sycamore, Ohio (Oct. '47)

Manning, Jud, Pres., Water Eng. Co., 1449 S. Broadway, Denver 10, Colo. (Oct. '47)

Marchand, Robert A., Chemist, Dept. of Water, Mahoning Ave., Warren, Ohio (Oct. '47)

May, Charles B., Foreman, Meter Dept., City Water Works, 2105—20th, N.E., Canton 5, Ohio (Oct. '47)

McCampbell, Paul, *see* Avon Lake Water Dept.

McLean, Claude E., Owner & Chief Chemist, Arizona Testing Labs., Box 1888, Phoenix, Ariz. (July '47)

McNutt, Harry, Gen. Foreman, Water Dept., 1608 Austin St., Lincoln Park, Mich. (Oct. '47)

Mettee, H. Irving, Sr. Engr., Bureau of Water Supply, 2528 Ellamont St., Baltimore 16, Md. (Oct. '47)

Neelly, J. M., Supt. of Distr., 909 E. 14th St., Pawhuska, Okla. (Oct. '47)

Nesbit, W. S., Field Engr., Johns-Manville Sales Corp., 2617 N. 8th St., Phoenix, Ariz. (Oct. '47)

Owen, Milo L., Operator, Water Dept., Sunbury, Ohio (July '47)

Patchen, C. B., City Supt., Box 465, Lindsay, Calif. (Oct. '47)

Peurifoy, John L., Director, Public Utilities, Municipal Bldg., Hamilton, Ohio (Oct. '47)

Pickett, Arthur, Industrial Waste Engr., Los Angeles County, 705 Union League Bldg., Los Angeles 12, Calif. (Oct. '47)

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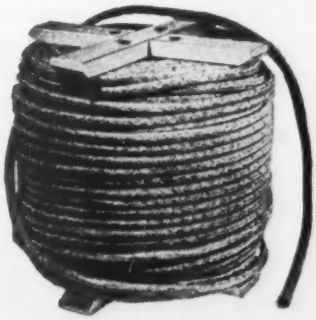

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Pierron, L. L., City Chemist, Water & Sewage, City Bldg., Greenville, Ohio (Oct. '47)

Plotkin, Sheldon N., Chem. Engr., Ralph M. Westcott Co., 1700 S. Main St., Los Angeles 15, Calif. (Oct. '47)

Pons M., Alfonso, Chief Engr., Div. de Estudios, Ministerio de Fomento, 1055 Arenida Husares ole Junin, Lima, Peru (Oct. '47)

Ragsdale, T. M., Vice-Pres., Layne Central Co., Memphis, Tenn. (July '47)

Reeves, Henry, Jr., Acting Mgr., Hercules Powder Co., 415 Rhodes Haverty Bldg., Atlanta 3, Ga. (Oct. '47)

Reimund, R. E., Engr., Ranney Method Water Supplies, Inc., 63 S. High St., Columbus, Ohio (Oct. '47)

Rivett, Dennis W., 1911 Franklin Ave., Saskatoon, Sask., Can. (Oct. '47)

Roberts, Charles E., Civ. Engr., California Oregon Power Co., Roseburg, Ore. (Oct. '47)

Robinson, W. M., Secy.-Mgr., Water Dept., 101 City Hall Bldg., Fort Worth, Tex. (Oct. '47)

Safford, M. A., Sales Engr., Wallace & Tiernan Co., Inc., 418 Flannery Bldg., Pittsburgh 13, Pa. (Oct. '47)

Sammons, William H., 206—5th St., Corbin, Ky. (Jr. M. July '47)

Sanderson, Charles E., Supervisor, Water Treatment Plant, Carbide & Carbon Chemical Corp., 159 Alabama Rd., Oak Ridge, Tenn. (July '47)

Sheets, Waldron D., Partner, Wyatt, Bird & Assocs., 85 N. High St., Columbus 15, Ohio (Oct. '47)

Sheffield Corp., Waterworks Com., J. Noel Wood, Gen. Mgr. & Engr., Town Hall, Sheffield, England (Corp. M. Oct. '47)

Smith, Donald R., City Supt., Davison, Mich. (Oct. '47)

Smith, Earl W., Supt., Water Dept., 712 S. 7th St., Upper Sandusky, Ohio (Oct. '47)

Smith, Murray M., City Engr. & Water Supt., Village Hall, Grosse Pointe Farms, Mich. (Oct. '47)

Stephenson, J. H., Chief Engr., Meigs Water Co., Middleport, Ohio (Oct. '47)

Swanger, G. F., Chemist, 98 N. Broadway, Shelby, Ohio (Oct. '47)

(*Continued on page 38*)

CENTRILINE *cement-mortar lining of water mains . . . a service of*

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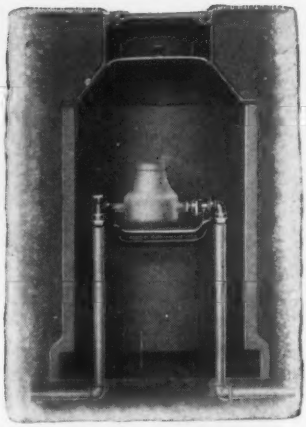
Quality pipe line products manufactured and installed by American include—
Lock Joint Concrete Cylinder Pipe · Prestressed Lock Joint Concrete Cylinder Pipe
American Concrete Cylinder Pipe · Centrifugal Concrete Pressure Pipe

SAVES REPAIR BILLS!



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METER PROTECTION

Ford Meter Box installations for outside meters are planned to provide ample protection in keeping with climatic conditions. Regardless of whether the frost line is six inches or four feet below the surface, there is a Ford design that keeps meters visible and accessible without danger of frost damage.

FREE CATALOG

Send today for free Ford Catalog that is a veritable manual on meter setting procedures.

FORD METER BOX CO.
Wabash, Indiana

FORD

METER BOXES

(*Continued from page 36*)

Tarrant, William J., Chemist, Water Works, Ezra Rust Drive, Saginaw, Mich. (Oct. '47)

Thomas, Evan, Supt., Fairport Water Dept., Village Hall, Fairport Harbor, Ohio (Oct. '47)

Thomas, Fred W., Sr. San. Engr., Health & Safety Dept., Tennessee Valley Authority, Wilson Dam, Ala. (Oct. '47)

Toyne, Warren D., City Mgr., City Hall, Painesville, Ohio (Oct. '47)

Turner, Clyde M., San. Engr., Patchen & Zimmerman, Engrs., Daniel Field Airport, Augusta, Ga. (July '47)

Vaughan, William F., Chemist, Tennessee Valley Authority, 407 N. Gay St., Knoxville, Tenn. (Oct. '47)

Wagner, Albert, Supt., Water Works, Gibsonburg, Ohio (Oct. '47)

Walters, M. H., Cons. Engr., Alden E. Stilson & Assocs., 630 E. Broad St., Columbus, Ohio (Oct. '47)

Weinberger, Leon W., Graduate Student, M.I.T. Graduate House, Cambridge 39, Mass. (Jr. M. Oct. '47)

Wilkinson, E. N., Town Mgr., Franklin, Va. (Oct. '47)

Williams, Donald B., In Charge of Purif., Public Utilities, Water Works Lab., Brantford, Ont., Can. (July '47)

Wittmer, Earl F., San. Engr., State Welfare Dept., 506 Mt. Vernon Ave., Marion, Ohio (Oct. '47)

Wood, J. Noel, *see* Sheffield Corp.

Yarabeck, Robert R., San. Engr., Black & Veatch, 1230 E. 8th Ave., Denver, Colo. (Oct. '47)

(*Continued on page 40*)

Filter Sand and Gravel

WELL WASHED AND CAREFULLY GRADED TO ANY SPECIFICATION.
PROMPT SHIPMENT IN BULK OR IN BAGS OF 100 LB. EACH.

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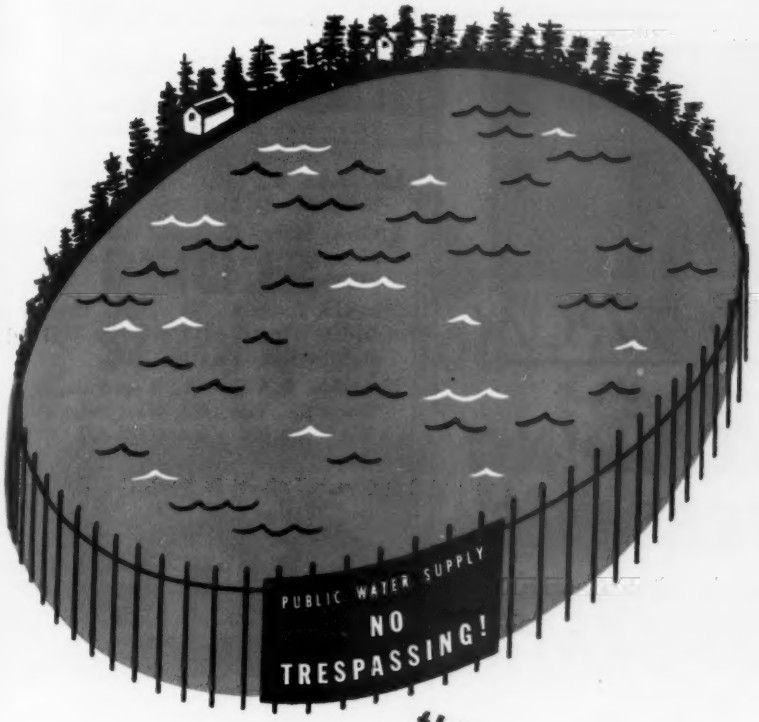

this keeps out humans,

but... it won't keep out algae, phenols and other contaminants. Such pollution in your raw water causes tastes and odors—now successfully removed with Mathieson's Chlorine Dioxide.

A powerful oxidizing agent, Chlorine Dioxide attacks algae . . . oxidizes phenols and other troublesome compounds . . . destroys bacteria as well. Tastes and odors are usually eliminated. Your community is served with water that is *good to drink*.

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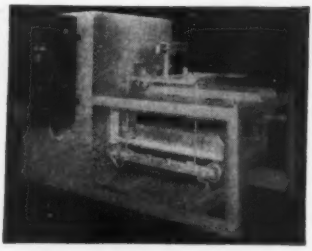
Chlorine Dioxide...Sanitation HTH...Liquid Chlorine...PH-Plus (Fused Alkali)...Caustic Soda...Soda Ash...Bicarbonate of Soda Ammonia, Anhydrous & Aqua...Carbonic Gas...Dry Ice...Sodium Chlorite Products Sodium Methylate



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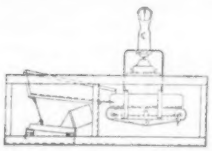
WEIGHING FEEDERS

provide ACCURATE CONTROL in the CONTINUOUS FEEDING of BULK CHEMICALS at a CONSTANT WEIGHT



Predetermined setting of the scale automatically maintains desired weighed flow of material per unit of time.

Write us about your problem.

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428 Lexington, Homer City, Pa.

(*Continued from page 38*)

REINSTATEMENTS

Harstad, H. T., c/o Navy Design Office, 2801—16th Ave., S.W., Seattle, Wash. (Jan. '42)

Lill, John R., 732 Charing Cross Rd., Baltimore 29, Md. (Apr. '43) *P*

Lyndes, Harry E., Local Mgr., General Chemical Co., 1271 W. Bayard St., Denver, Colo. (Jan. '41)

Ningard, Louis G., Sr. Engr., Bureau of Water Supply, 5522 Windsor Mill Rd., Baltimore 7, Md. (Apr. '42)

Reynolds, R. W., Supt., West Palm Beach Water Co., Box 1311, West Palm Beach, Fla. (Nov. '26) *Director '40–'42. Fuller Award '41. AMP*

Scheinert, Albert G., Sales Mgr., Rensselaer Valve Co., 1404 Oliver Bldg., Pittsburgh, Pa. (Oct. '39)

Snyder, Clifford A., Chief Chemist, City Utilities, Barberton, Ohio (July '44)

Spindler, H. A., Supt., Water Dept., City Bldg., Marietta, Ohio (Oct. '47)

Tait, Robert S., 827 California St., Santa Cruz, Calif. (Oct. '25)

LOSSES—Resignations

Brown, M. H., Secy.-Gen. Mgr., Erwin Water Co., Erwin, Tenn. (Jan. '46) *A*

Community Public Service Co., E. A. Cain, Div. Mgr., 119 E. Walker St., Breckenridge, Tex. (Corp. M. Oct. '45)

Horacek, Joseph, Jr., Tech. Service Repr., Hercules Powder Co., 415 Rhodes Haverty Bldg., Atlanta, Ga. (Apr. '45)

Changes in Address

Changes received between September 5 and October 5, 1947

Adams, John M., 1226—3rd Ave., W., Seattle 99, Wash. (Apr. '40) *AMP*

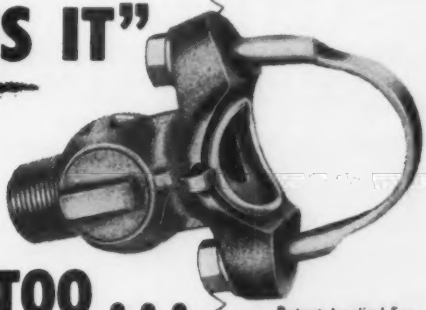
Alderman, Frank E., c/o Homes & Narver, 824 S. Figueroa St., Los Angeles 14, Calif. (Oct. '39) *MP*

Baumann, Edward Robert, Research Assoc. in San. Eng., 810 N. Coler, Urbana, Ill. (Jan. '47)

Bickel, Wilbur E., Chief Engr., Water Eng. Co., 1337 Walnut, Denver 10, Colo. (July '46)

(*Continued on page 42*)

"EASY DOES IT"



QUICKER— STRONGER, TOO . . .

Patent Applied For

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Combination Corporation Stop and Saddle for Cast Iron or Steel Pipe

It's quick . . . it's simple . . . it's safe. It's the corporation stop that water companies and municipalities have needed for a long time. Especially today, with the large scale housing projects and the demand they put on the service department, the Hays "Duo-Stop" is an important time-saver in making connections to small mains.

There's no interruption of service . . . there's no tapping of the main . . . there's no weak spot in the connection.

The "Duo-Stop" Combination Corporation Stop and Saddle is strong . . . stop and service clamp are of one-piece solid, rust-proof bronze . . . it is pressure-tight and leakless.

The Hays "Duo-Stop" is built to serve and built to last.

Write today for Folder 105

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WATER WORKS PRODUCTS

HAYS MANUFACTURING CO., ERIE, PA.

(*Continued from page 40*)

Blumberg, Oscar C., 1558 Beverly Pl., Berkeley, Calif. (Feb. '30) *P*

Brune, Fred H., Roberts & Brune Co., 115 Townsend St., San Francisco, Calif. (Sept. '31) *MP*

Cohrs, R. W., San. Engr., Dept. of National Health & Welfare, Family Allowances Box, Halifax, N.S., Can. (Jan. '47)

Damann, Kenneth E., Botany Dept., Eastern Illinois State College, Charleston, Ill. (Jan. '44) *P*

Edwards, David F., 1027 Ingleside Drive, Baton Rouge, La. (Oct. '42) *P*

Fischer, Robert A., Supt., Water Works, Box 23, Covington, Ky. (Jan. '45) *MP*

Flynn, A. P. Mickey, Meter Repairman, Wichita Water Co., Box 1442, Wichita, Kan. (Jan. '47)

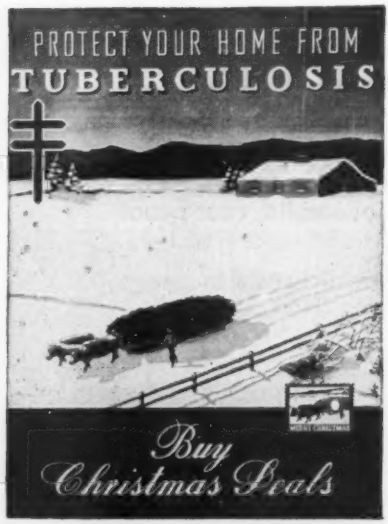
Forrest, Kyle, Cons. Engr., 2360 Chestnut St., San Francisco 23, Calif. (July '35)

Garland, Chesley F., San. Eng. Lab., Johns-Hopkins Univ., Baltimore 18, Md. (Jan. '42) *AMP*

Gilman, Harry, Toxicologist, Box 123, Folsom, Pa. (Apr. '39) *P*

Gregory, Robert W., Route No. 5, Box 43, Greensboro, N.C. (Apr. '39) *MP*

Howell, W. Y., Trenton, Tenn. (Jan. '42)



Iowa Valve Co., J. W. Dousette, Gen. Sales Mgr., 201 N. Talman Ave., Chicago, Ill. (Assoc. M. Nov. '28)

Jobe, Lowell A., Dept. of Eng., Univ. of Idaho, Moscow, Idaho (Oct. '44) *P*

Karpen, Raymond J., Major, Surgeon General's Office, 2C-482 Pentagon Bldg., Washington 25, D.C. (Jan. '46) *P*

Kent, Frederick S., 1373 Sudbury, Willow Run, Mich. (Apr. '42) *P*

Kimball, Clyde L., Route No. 1, Box 1326, Vista, Calif. (Oct. '43) *M*

Kopp, Joseph P., 114 Sexton St., Struthers, Ohio (Oct. '44) *MP*

Metcalf, Frank, 6009 Eucalyptus Lane, Los Angeles 42, Calif. (Oct. '43) *M*

Mills, G. H., Supt., Water Dist. No. 2, 16906—15th Ave., N.E., Seattle 55, Wash. (Jan. '42)

Newman, Alfred C., 1107 S. 8th St., Leesburg, Fla. (July '37) *M*

Pratt, Jack W., Process Engineers, Inc., 406 Montgomery St., San Francisco 4, Calif. (Jan. '41)

Rardon, George E., Supt. of Distr., 633 Quincy St., Fredonia, Kan. (Oct. '46)

Schwartz, Fred D., Assoc., Lloyd & Schwartz, Engrs., 1324½ Wilshire Blvd., Los Angeles 14, Calif. (July '44)

Slagle, Emil C., Special Services Section, State Dept. of Health, Minneapolis, Minn. (Jan. '46) *MP*

Stanley, J. A., Jr., 2522 Ave. H, Lubbock, Tex. (Jan. '46) *MP*

Stevenson, Albert H., San. Engr., U.S. Public Health Service, Water & San. Investigations, E. 3rd & Kilgour Sts., Cincinnati 2, Ohio (Jan. '40) *P*

Sylvester, Robert O., Asst. Prof. of Civ. Eng., Univ. of Washington, More Hall, Seattle 5, Wash. (Jan. '46) *P*

Tatum, R. L., Engr., Box 843, Shreveport, La. (Oct. '45)

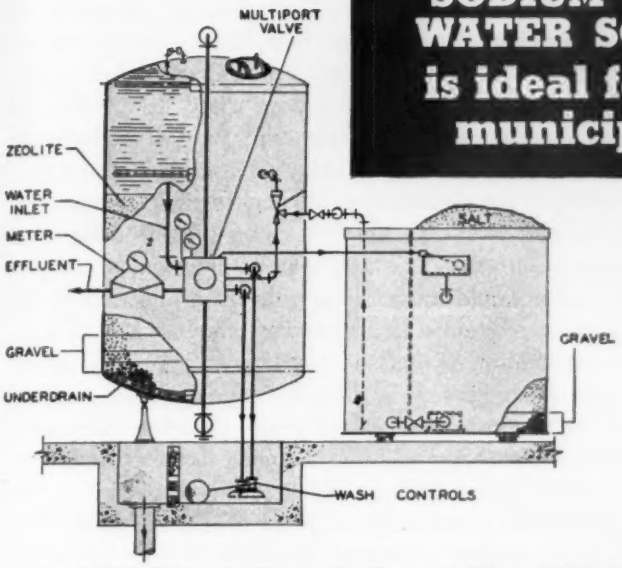
Voden, Stewart, Chemist, Water Works, 2512 Central Ave., W., Great Falls, Mont. (Jan. '39) *MP*

Walker, Walter E., 26 Ziegler Ave., Poughkeepsie, N.Y. (Mar. '29) *MP*

Warren, M. A., 403 E. Jefferson St., Iowa City, Iowa (Apr. '47)

Williamson, Joe, Jr., Vice-Pres., Russell & Axon, Inc., Cons. Engrs., Box 1548, Daytona Beach, Fla. (July '40) *P*

Why LIQUON SODIUM ZEOLITE WATER SOFTENER is ideal for many municipalities



Write for Bulletin 5 describing LIQUON Zeolite Water Softeners, and for advice, without obligation, on any water-treatment problem.

A LIQUON Sodium Zeolite Water Softener is frequently the most advantageous method of softening hard water for households and industries, and has the following advantages as compared to other processes such as lime soda:

- **Usually occupies much less space, due to its efficient design and the use of LIQUONEX CR, the modern high-capacity non-siliceous resin type of zeolite**
- **Easier and simpler to operate, by means of an efficient single multiport valve which controls all operations with one lever**
- **The treated water is stable and does not tend to after-react, even when the raw water varies in composition**
- **Chemical costs less when non-carbonate hardness is high**
- **Handling of chemical is much less troublesome**
- **Forms no precipitates or sludge to cause disposal problems**
- **Does not add any objectionable excess of reagent to the water**
- **Can be operated under pressure and avoids re-pumping**

LIQUON equipment designs and process recommendations are based on 30 years of experience in specializing on water-conditioning problems.

LIQUON

LIQUID CONDITIONING CORPORATION

114 East Price Street, Linden, N. J.
Engineering Service Representatives in Principal Cities

LIQUID CONDITIONING CORP.,
114 East Price St., Linden, N. J.

Please send me, without obligation, information on water softening for municipalities

NAME .....

TITLE .....

COMPANY .....

ADDRESS .....
JAWWA-11-47

(*Continued from page 22*)

The Missouri River Basin, according to an exhaustive report prepared by the Midwest Research Institute of Kansas City, Mo., for the Corps of Engrs., is about to experience an era of expanding agricultural, industrial and mineral processing activities. The stimulus, according to the survey, is the river development program, now in its second year of construction, authorized by Congress in the 1944 Flood Control Act.

The institute, a nonprofit research organization, based its conclusions upon a scientific analysis of the potentialities of the major natural resources in the region. In predicting the utilization of the industrial and agricultural possibilities of the basin, which is the nation's greatest food-producing area, the report observed that the end result should be a more balanced regional economy. It was pointed out that the anticipated development of the water resources of the basin would increase agricultural production by 25 per cent, and the production of processed agricultural materials by at least 50–60 per cent. The explanation is that the development projects, which include the irrigation of approximately 5,000,000 acres of new lands, are expected to encourage the production of special crops, stimulate the establishment of new processing plants and stabilize the vital livestock industry. The general economic stabilization that should result is expected to reverse the decreasing population trend in some of the states and so further encourage the development of new industries which will draw upon the vast natural resources of the region.

William E. Mueller, 1894–1947

Unexpectedly, and apparently as the result of a heart attack, William E. Mueller, President and Treasurer of the Mueller Co., died at Decatur, Ill., on September 22, 1947. His death ended 25 years of service in the administration of Mueller Co. affairs, as he was first elected to the Board of Directors of the company in 1922—after some previous experience in lesser capacities in the factory—and was immediately placed in charge of sales.

Thereafter his rise in the organization was steady. He became first Treasurer, then Executive Vice-President and, finally, in 1939, President, succeeding his father, Adolph Mueller, who became Chairman of the Board of Directors. Under his leadership the company manufactured munitions during the recent war and was awarded the Army-Navy "E" award.

His life was characterized by an unassuming quiet, and his many activities on behalf of the community welfare were performed with sincerity and dignity, and without publicity.

(*Continued on page 46*)

WF

Cast Iron Pipe

Manufactured in Sizes 2" to 96"—

Bell and Spigot Pipe **Special Castings**

Flanged Pipe **Flexible Joint Pipe**

Short Body B. & S. Specials

Warren Spun Centrifugally Cast Iron Pipe

Warren Foundry & Pipe Corp.

and

Warren Pipe Co. of Massachusetts, Inc.

Sales Offices
11 Broadway, New York 4, N. Y.
75 Federal St., Boston 10, Mass.

Works
Phillipsburg, N. J.
Everett, Mass.

(*Continued from page 44*)

Once the eyesores of the community, elevated tanks have come a long way since the turn of the century. In a recent JOURNAL paper (p. 651, July issue), Donald A. Leach described recent progress in tank design. His illustrations contrasted the pleasing appearance of present-day spheres and spheroids with the "outhouse on stilts" design of early structures, but he neglected to mention the even more radical trend represented by at least two representationally triumphant designs at Honolulu and Chicago. A 100,000-gal. tank at Honolulu is an oversized elevated replica of a pineapple; and a 30,000-gal. sphere at Tam O'Shanter Golf Club, just outside Chicago, has been constructed in the form of a golf ball atop a large tee. The possibilities of such graphic treatment are of course unending. Any day now, on the premises of the Holeproof Hosiery Mills, we expect to see the shapeliest standpipe of them all.

David B. Hill has been appointed Dist. Field Engr. in the Atlanta office of Chain Belt Co., Milwaukee, Wis. Previously Hill, who joined the organization in 1937, had been an Application Engr. in the company's Conveyer Div. at Milwaukee.

(*Continued on page 48*)

SPEED LAYING
and REPAIRS
on Bell & Spigot Lines
by using a

HYDE-RO RING
in Every Joint

• Saves repeated flushing—water, hypochlorite, time and labor • Promotes sterilization Secures tight joints quickly • Easily inserted Works with plain or beaded pipe. Made for 4, 6, 8, 10 & 12" pipe.

Works with *Tegul*-MINERALEAD, lead or Portland Cement • write for more information.

THE ATLAS MINERAL PRODUCTS COMPANY
of Penna. . . . Mertztown, Pennsylvania

Manufacturers of Tegul-MINERALEAD
ingot form jointing compound for B.&S. Pipe.
Also G. K. SEWER JOINT COMPOUND

Vogt

Fire Hydrants
Standard—"Traffic Model"—Flush Type—Water Crane Type

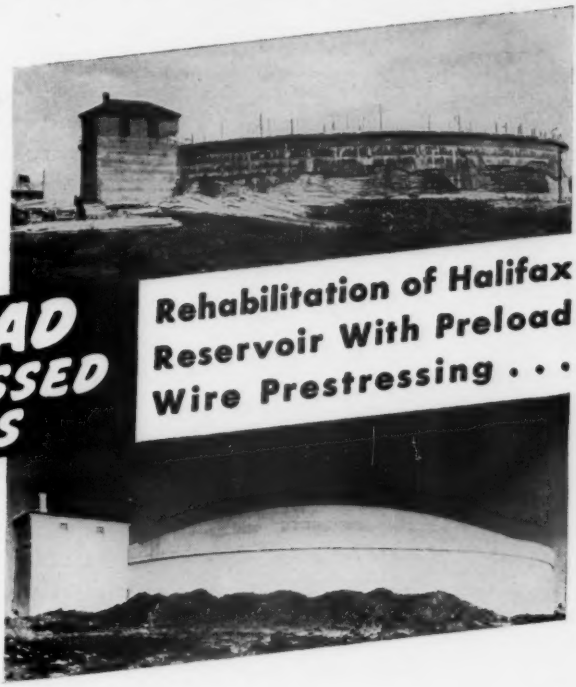
Vogt

Gate Valves
Non-Rising Stem—Outside Screw and Yoke—Hub End—Flanged End—Ends to Fit Any Type Pipe

Also—Floor Stands, Shear Gates—Tapping Sleeves and Valves—Flap Valves—Mud Valves

Vogt

Brothers Mfg. Co., Inc.
Main at 14th Street, Louisville 3, Ky.



Halifax, N. S. reservoir before rehabilitation.

PRELOAD PRESTRESSED DOMES

Rehabilitation of Halifax Reservoir With Preload Wire Prestressing . . .

Reservoir after rehabilitation, showing Preload Prestressed Dome.

Reconstruction of the 3½ million gallon Halifax, N. S. reservoir by Preload Company of Canada Ltd. (Subsidiary of The Preload Corp. of New York) and Canada Gunite, Ltd., plus the addition of 500,000 gallons new capacity, has been carried out by the use of PRELOAD WIRE PRESTRESSING on the dome ring which carries the load of the new dome roof, the largest of its kind ever built (164 ft. 3 in. diameter). 42 miles of 0.162″ high tensile (200,000 psi.) strength wire was applied by the PRELOAD WIRE PRESTRESSING MACHINE at an initial stress of 140,000 psi. The wire was applied in five layers, each layer of wire being bonded with a coating of gunite and the entire ring being finished off with a one inch gunite cover coat. (See articles in June '47 Journal of American Water Works Association and Aug. 7, 1947 Engineering News-Record).

This reservoir, built in 1913, represented a serious problem caused by erosion and spalling due to ice action and severe winter weather conditions. The availability of materials for this type of reconstruction (to meet an urgent time factor), and substantial economies over other methods of rehabilitation, all made it possible for PRELOAD to demonstrate the same economy and freedom from long-term maintenance costs which characterizes PRELOAD'S construction of new tanks and other circular structures.

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THE PRELOAD COMPANIES

420 LEXINGTON AVE., NEW YORK, N. Y.

Designers and Builders of Prestressed Concrete Storage Tanks and Pressure Pipe
Prestressed Concrete Bridges and Cement Lining of Pipe in Place

The Preload Corporation
New York—Boston—Washington

Preload Central Corporation
St. Louis—Chicago—Kansas City

PRELOAD

Preload Pacific Corporation
San Francisco—Los Angeles

The Preload Co. of Canada, Ltd.
Montreal—Toronto—Halifax

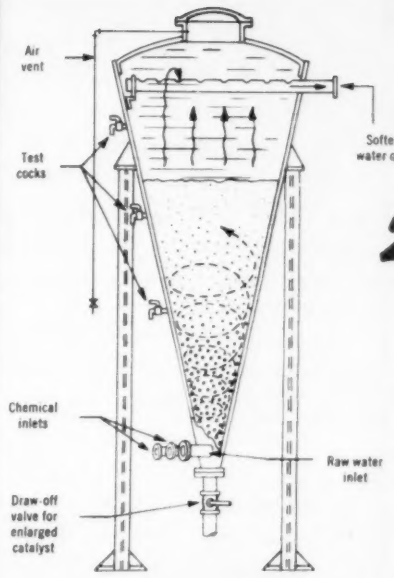
(*Continued from page 46*)

Surplus pipe, fittings and valves are still being disposed of by the Purchasing Dept. of the Tennessee Eastman Corp., Kingsport, Tenn. A description of the material available—subject to prior sale—and the price is carried in the revised listing below as a service to Journal readers in need of such equipment.

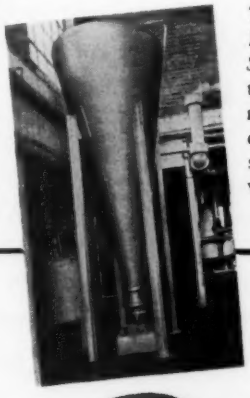
Quantity	Description
72 ft.	60-in. diam. × 12 ft. long cast-iron pipe, B&S
492 ft.	42-in. B&S pipe, Class B, 12-ft. lengths
108 ft.	30-in. diam. Class 150 B&S pipe in 12- and 18-ft. lengths
2	48-in. 11¼-deg. bends, Class B, B&S
3	42-in. 45-deg. bends, Class B, B&S
1	36-in. 45-deg. bend, Class D, B&S
1	30-in. 90-deg. bend, Class B, S&S
1	30-in. 90-deg. bend, Class B, B&S
2	30-in. 90-deg. bends, concrete lined, Class B, B&S
1	30-in. 45-deg. bend, Class D, B&S
1	30-in. 45-deg. bend, Class D, B&B
1	30-in. 22½-deg. bend, Class D, B&S
2	30-in. 90-deg. bends, FF&D 125# std.
2	24-in. 45-deg. bends, Class B, B&S
5	24-in. 22½-deg. bends, Class B, B&S
3	20-in. 90-deg. bends, FF&D 125# std.
2	20-in. 45-deg. bends, Class B, BB
2	20-in. 90-deg. bends, concrete lined, FF&D 125# std.
2	20-in. 90-deg. bends, short radius FF&D 125# std.
2	18-in. 45-deg. bends, Class B, B&S
2	24-in. plugs, Class B
1	60 × 42-in. reducer BS, Class B, slightly used
1	36 × 30-in. reducer SB, Class D
1	36 × 20-in. reducer SB, Class D
1	36 × 20-in. reducer SS, Class D
1	30 × 20-in. reducer BB, Class D
2	30 × 20-in. reducers BS, Class B
1	30 × 20-in. reducer SB, Class D
1	30 × 18-in. reducer SS, Class B
1	30 × 16-in. reducer BS, Class D
1	24 × 18-in. reducer SS, Class D
1	24 × 20-in. FFD reducer, concrete-lined, 125# std. drilling
6	60-in. sleeves 15-in. long, Class B
6	48-in. sleeves 15-in. long, Class B
2	42-in. sleeves 15-in. long, Class B
4	20 × 15-in. sleeves, Class B
1	60 × 60 × 24-in. tee, Class B, BSB
1	42 × 42 × 42-in. tee, Class B, BSB
1	42 × 42 × 16-in. tee, Class B, all bell
1	36 × 36 × 30-in. tee, concrete, ribbed and posted, Class B, all bell
1	30 × 30 × 30-in. tee, ribbed and posted, Class B, all bell
1	30 × 30 × 18-in. tee, Class D, BBB
1	24 × 24 × 24-in. tee, Class B, BBB

(*Continued on page 50*)

PERMUTIT'S sludgeless cold lime SPIRACTOR



SOFTENS WATER 20 times faster



The New Permutit Spiractor—the faster, more efficient way of softening water.

. . . than old style conventional type treating systems. Due to the short detention time required, the Permutit Spiractor offers the maximum output in the minimum space!

Here's how it works: Hard water and the required lime enter tangentially (see diagram) at a rate of flow high enough to suspend the catalyst bed of calcium carbonate granules, but low enough to prevent their carryover. In the upward, swirling motion imparted to the treated water, the resultant precipitates—products of the water softening reaction—are deposited on the catalyst granules by accretion. The effluent is a soft, low alkalinity water suitable for filtration as required.

Write to the Permutit Company, Dept. JA-11, 330 West 42nd Street, New York 18, N. Y., or to the Permutit Company of Canada, Ltd., Montreal.

for 34 years

Permutit

WATER CONDITIONING HEADQUARTERS

(*Continued from page 48*)

Quantity	Description	Quantity	Description
1	24 × 24 × 20-in. tee, Class B, all bell	1	10 × 10 × 6-in. tee, Class D, BBB
2	24 × 24 × 18-in. tees, Class B, BBB	1	10 × 8 × 6-in. tee (used), Class D, BBB
2	20 × 20 × 8-in. tees, Class D, BBB	1	30 × 30 × 24-in. "Y," Class B, BSB

Prices

60-in. pipe—$25.00 per ft.
42-in. pipe—$20.00 per ft.
30-in. pipe—$9.00 per ft.
All fittings—$150.00 per net ton

Quantity	Description	Price Each
1	48-in. Kennedy gate valve, bell ends, I.B.B.M., spur geared, 150# water working pressure, with 8-in. by-pass and clean out.	$2,660.00
1	42-in. Kennedy gate valve, bell ends, spur geared, 150# water working pressure, with 6-in. by-pass and clean out.	2,000.00
4	24-in. Kennedy gate valves, bell ends, I.B.B.M., spur geared, for water working pressure of 150#, non-rising stem, with 4-in. by-pass and clean out.	630.00
2	24-in. Chapman gate valves, bell ends, L59½ FEIS, with handwheel.	430.00
2	24-in. M&H gate valves, bell ends, I.B.B.M., for water working pressure of 150# non-rising stem and bevel gear, wrench operated.	575.00
3	6-in. M&H gate valves, bell ends, I.B.B.M., non-rising stem with operating nut, water working pressure of 150#.	35.00
1	24-in. valve I.B.B.M. non-slam check valve, Chapman, List 23	250.00
1	12-in. M&H swing check valve, BE, all iron, 150 O.W.G.	150.00

Solvay Sales Corp. has announced the appointment of Neal M. Draper as Manager of the St. Louis branch, which covers the territory from Nebraska south to Oklahoma and Arkansas, and west to and including the Rocky Mountain states. Draper, who has been a salesman in the St. Louis territory for the past twelve years, succeeds M. S. Johnson, who has been transferred to the Boston office. Elmer Seener has been appointed Asst. Branch Manager of the St. Louis branch.

(*Continued on page 54*)

IRON PIPE IN 25 CITIES

than 99 per cent of these mains are still in service.

With the permission of the A.W.W.A. we have reprinted the facts as they apply to cast iron pipe in a brochure "Survival and Retirement Experience With Cast Iron Water Mains." If you have not received a copy, write us.

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

"SILENT SERVICE is not enough"—A.W.W.A.

The American Water Works Association is recommending to its members, for local action, a sound, well-planned program of Public Relations publicity and advertising. It is based on the premise that good water service, like good health, is too often taken for granted, in which case favorable public opinion is dormant.

To co-operate with this program and help to arouse national recognition of the efficient service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* readers of "Time" and "Nation's Business" throughout 1947.

For example, the following human-interest cartoon and excerpts from a current advertisement

the bucket brigade

In great-grandfather's time, when public water supply systems were few and far between, a house on fire was a real threat to the community. Today, in 13,000 communities, public water supply systems provide sufficient water to control fires in addition to supplying home and industrial needs. A thousand gallons a minute from modern firefighting equipment may be unfair to bucket brigades but is mighty comforting to property owners.

Because it is dependable and long-lived, cast iron pipe is the standard material for underground mains supplying water for fire protection as well as domestic needs.

Remember that your public water supply system not only protects your property but guards your health by providing safe, palatable water—and for less than a dime a ton.

Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 So. Michigan Avenue, Chicago 3, Illinois.

SERVES FOR CENTURIES

(*Continued from page 50*)

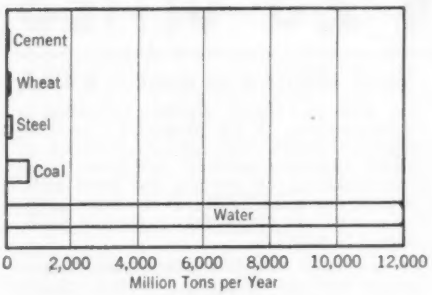


FIG. 1. Weight of Commodities Produced

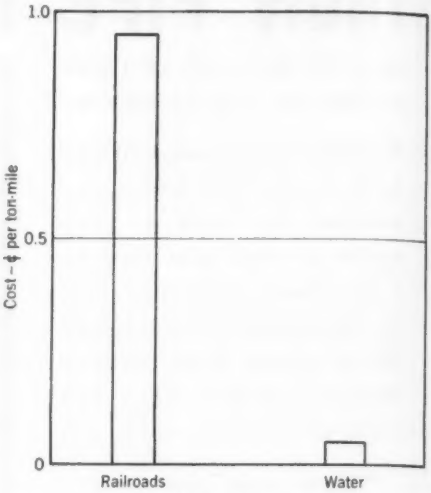


FIG. 3. Transportation Costs

Reproduced herewith are the corrected figures for the paper "Adjusting Rate Structures to Rising Cost Levels" by Louis R. Howson (September Jour. A.W.W.A., **39**: 820–21). The figures may be cut out and mounted over the originals with a suitable paste. A detailed erratum notice for the portions of the text that were in error appeared on page 1066 of the October JOURNAL.

"Performance Standards," a new publication issued by the Technical Office of the Housing and Home Finance Agency, has as its objective the establishment of a uniform basis for measuring the adequacy of building materials and home construction methods. Standards are proposed for such structural elements of the house as floors, walls, partitions, ceilings and roofs. Data on insulation requirements are also included.

The pamphlet emphasizes the importance of developing performance standards for such structural systems and materials, rather than stating requirements in terms of types, grades, dimensions, spacings, mixes, or other similar qualities which are frequently specified in building codes. The former approach provides considerably more flexibility in the use of new materials and building techniques, and therefore may be considered essential to the modernization of building codes for the construction of dwellings.

Because this is the first attempt to set up such standards, comments and suggestions for improving the requirements will be welcomed. It is expected that, as the standards are applied under varying conditions, additional knowledge will be forthcoming which eventually will lead to a nationally accepted set of performance standards.

Copies of the booklet may be obtained from the Housing and Home Finance Agency, Washington 25, D.C.

(*Continued on page 56*)

and **HOW** *it's different*

The exclusive operating principle that sharply differentiates the ACCELATOR from other treatment equipment is a directed flow of slurry and "dynamic separation" of treated water from its surface.

Treated water separates and rises rapidly approximately at right angles to the surface of the dynamic lateral flow of slurry instead of percolating up through a sludge blanket. This means faster delivery of ACCELATOR treated water.

ACCELATOR installations regularly report a high quality of treated water.

Send for a copy of ACCELATOR Bulletin 1824. INFILCO Inc., 325 West 25th Place, Chicago 16, Ill.

*Trade-Mark Reg. U.S. Pat. Off.

ACCELATOR
Advantages

- Compact Unit
- Low Cost
- Simple Operation
- Fast Reaction
- High Rate
- Automatic Sludge Removal

IF YOU WANT TO KNOW — ASK INFILCO

(*Continued from page 54*)

A handbook on wells is being published by the Missouri Water Well Drillers Assn. as a guide to the drilling, testing and operation of water wells. Entitled *Water Well Handbook*, it contains 200 pages of charts, tables and other data on the subject. It is expected that the book will be available for distribution soon, and it will be sold at cost (approximately $1.50 a copy).

Water Resources of Tuscarawas County, Ohio, are described in Bul. 6 of the Ohio Water Resources Board, Columbus, Ohio, and may be obtained at a cost of $1.00 a copy. The report is a mimeographed addition to the series of ground water studies being prepared by the board in co-operation with the U.S. Geological Survey.

The Foxboro Co., Foxboro, Mass., maker of industrial instruments for measurement and control, announces the appointment of Milton E. Routh as Manager of the territory of its Shreveport, La., office. Routh had been engaged in instrument engineering with leading oil companies and is well acquainted in industrial circles in the Southwest, where he has spent most of his life.

(*Continued on page 60*)

On Call . . .
to tell your story for you!

Willing Water wants work on or as your public relations staff. Let him be your spokesman to your customers . . . to your personnel. You'll find him a master of the art of putting across your ideas... of soliciting co-operation ...of establishing good will. Call him up... put him to work on your publicity, your signs, your bulletins, your bills, your reports... you'll find him ready, able and, of course, willing.

Low-cost blocked electrotypes or newspaper mats, in 32 different poses, are immediately available to you. Write now for a catalog and price list to:

AMERICAN WATER WORKS ASSOCIATION
500 Fifth Avenue • New York 18, New York

● Cut-away view of filter tank showing installation of underdrain plates and filter media.

A FEW ADVANTAGES of this Modern Underdrain System

1 No mud ball formations
2 Graded gravel eliminated
3 Low head loss
4 Less wash water
5 Uniform backwashing
6 Low maintenance
7 No clogging or corrosion
8 Longer filter runs
9 Easy to operate
10 Easy to install

Underdrain Plates

BY CARBORUNDUM

TRADE MARK

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company

(*Continued from page 56*)

NEW YORK SECTION MEETING

About 230 persons attended the annual fall meeting of the New York Section, which was held at the Hotel Champlain, Plattsburg, N.Y., on Sept. 4 and 5. The Section departed somewhat from its usual custom of having the meeting in one of the largest cities in the state, and made arrangements to utilize the entire facilities of this excellent hotel on Lake Champlain, in the Adirondack Mountains. The many resort activities available and the good weather supplemented the fine technical program to make the meeting very successful.

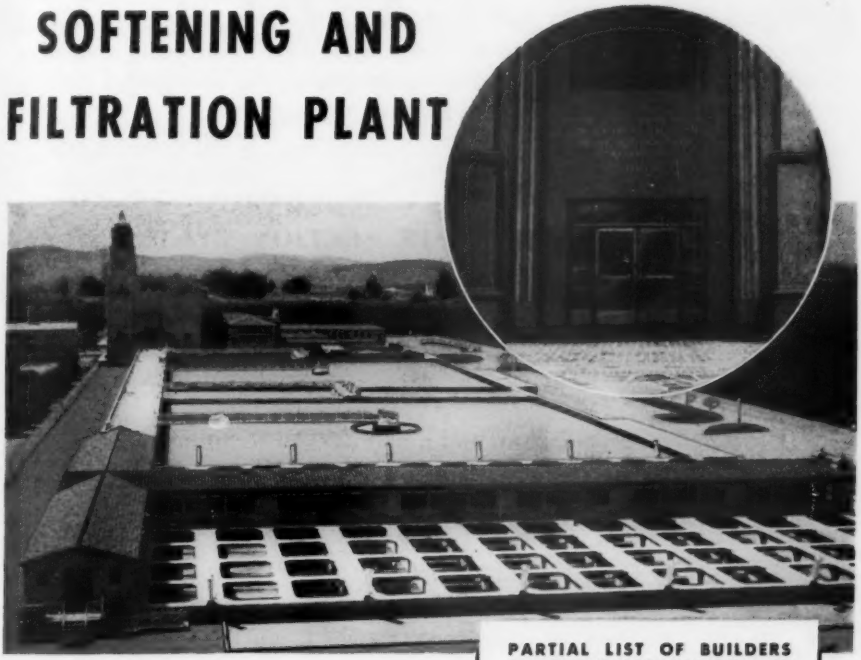
One of the main features was a symposium based on the group meetings of the Association's Annual Conference in San Francisco during the summer. The papers presented there by the Water Purification, Plant Management and Operation, and Finance and Accounting Divisions were reviewed and their most interesting aspects discussed. William S. Foster, Eng. Editor of *American City*, discussed the papers on "Adjusting Rate Structures to Rising Cost Levels" (Howson, September Jour. A.W.W.A., **39**:819); on revenue bond financing (Robinson and Thompson, October Jour. A.W.W.A., **39**:1021 and 1032); and on "Water Main Extension Policy" (Weir *et al., this issue*, p. 1067). A. E. Griffin, Director of Technical Service of the Wallace and Tiernan Co., Inc., followed with a discussion of "Water Purification." The national Conference papers on ground water pollution (Doll and Goudey, October Jour. A.W.W.A., **39**:1003 and 1010) and on the use of public water supplies for mass medication (Wolman, September Jour. A.W.W.A., **39**:834) were then discussed by George E. Symons, Assoc. Editor, *Water and Sewage Works*. The conference symposium was concluded with a discussion by F. B. Marsh, Assoc. Editor, *Water Works Engineering*, of the papers "Value of Public Service Commission Control" (Kuranz), "Water Works Rules and Regulations" (Hatcher) and "Significance of Legislation Forbidding Strikes by Public Employees" (LaDue, September Jour. A.W.W.A., **39**:844).

"Life Stream," an absorbing motion picture prepared by the Water Dept. of Kansas City, Mo., was presented through the courtesy of Melvin P. Hatcher, Director. It is strongly recommended that any Section desiring the use of this fine, nontechnical picture place its request with Mr. Hatcher.

"Ground Water Supplies in the State of New York" is the title of the paper presented by M. L. Brashears Jr., District Geologist of the U.S. Geological Survey at Jamaica, N.Y. Charles R. Cox, Chief, Bureau of Water Supply, State Dept. of Health, discussed "Recent Trends and Developments in Water Supplies." At the banquet on the evening of Sept. 4, A.W.W.A. President N. T. Veatch delivered an address on the "American Water Works Association and Its Advantages."

(*Continued on page 62*)

BUILDERS AGAIN AT THE LA VERNE SOFTENING AND FILTRATION PLANT



The Metropolitan Water District of Southern California in doubling the capacity of its water softening and filtration plant at LaVerne, California, opens its doors again to Builders Equipment. The new 100 m.g.d. addition, like the original plant, will have Builders Gauges, Controllers, Diaphragm Pendulum Units, and Master Controls.

Bringing water from the Colorado River and distributing it to the district member cities has been one of the world's great engineering accomplishments. It is a tribute to the performance of the original equipment on this great project that Builders Equipment is again specified . . . no better recognition of quality and dependability could be awarded any product. Through the years an ever-increasing volume of repeat business has come to Builders from satisfied customers.

For Bulletins describing Builders Equipment address Builders-Providence, Inc. (Division of Builders Iron Foundry) 25 Codding St., Providence 1, R. I.

PARTIAL LIST OF BUILDERS EQUIPMENT FOR ADDITION AT LaVERNE, CALIFORNIA

- 24 Model RCB Rate Controllers, 20" and 24"
- 24 Diaphragm Pendulum Pilot Valve Units
- 24 Recording Gauges with strip charts
- 12 Loss of Head Air Operated Transmitters
- 24 Rate of Flow Air Operated Transmitters
- 2 Master Controls (grouped in sixes)
- 1 Twelve-Unit Air Summator
- 1 Special Summation Unit

All Instruments are Air Operated

BUILDERS PRODUCTS

Venturi, Propelofio and Orifice Meters • Venturi Filter Controllers and Gauges • Type M and Flo-Watch Instruments • Kennison Nozzles • Master Controllers • Conveyofio Meters • Chronofio Telemeters • Wheeler Filter Bottoms • Manometers • Filter Operating Tables

BUILDERS PROVIDENCE

Instruments

(*Continued from page 60*)

The remaining day of the meeting was devoted to a Water Works Conference Session, led by S. P. Carman, Cons. Engr., Binghamton, N.Y. Among other topics dealt with at this session were labor costs and labor-saving methods, equipment replacement programs, the anticipated shortage of diesel oil, and water for modern air conditioning.

R. K. BLANCHARD
Secretary-Treasurer

KENTUCKY-TENNESSEE SECTION MEETING

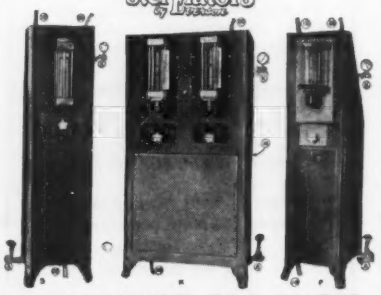
The nineteenth annual meeting of the Kentucky-Tennessee Section of the A.W.W.A., and the first annual meeting of the Kentucky-Tennessee Industrial Wastes and Sewage Works Assn., were held at the Brown Hotel, Louisville, Ky., September 22–24, 1947. The total registration, including 24 ladies, was 133.

The program included two and a half days of technical sessions and a visit to the Louisville Water Plant on the afternoon of the third day. Representing the parent organizations were A.W.W.A. President N. T. Veatch and F.S.W.A. President George S. Russell.

(*Continued on page 64*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

Sterflators by Everson



PURIFICATION FOR WATER, SEWAGE & SWIMMING POOLS

Everson SterElators Operate Manually or Semi-Automatically, Also Automatically Proportion Gas Flow to Water Flow.

Everson SterElators Utilize a 24" Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1

All SterElators are Dependable, Accurate, Safe and Easy to Operate. Guaranteed to Give Complete Satisfaction.

Sterflators by Everson

EVERSON MANUFACTURING CORPORATION
221 West Huron Street, Chicago 10, Illinois

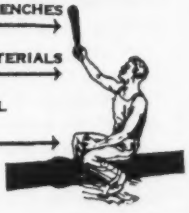
3 *Money, Time and Labor Saving Features of*

UNIVERSAL
CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.



For water supply, fire protection systems, sewage disposal systems, industrial, and irrigation. Flexible.

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THE CENTRAL FOUNDRY COMPANY
366 FOURTH AVENUE, NEW YORK 16, N. Y.

Gentlemen: Send us information and catalog on UNIVERSAL CAST IRON PIPE.

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SERVICE...

. . . with a *wrench* !

Easy servicing is another one of the reasons why you'll go big for LUDLOW Hydrants! One man with a wrench can remove stem and working parts as a single unit whenever maintenance or inspection is required. There's nothing to unscrew below the ground level!

IMMEDIATE SHIPMENT!

HUB END VALVES

Double Gate—A.W.W.A. Specifications 2 in. to 12 in.

Also Normal Delivery on Valves in Larger Sizes and *rapid* delivery on Hydrants.

H-71

THE LUDLOW VALVE MFG. CO., INC., TROY, N.Y.

LUDLOW HYDRANTS

Superior Features Since 1866

(*Continued from page 62*)

Byron E. Payne, Chairman of the Section, presided over the joint meeting. Featured speakers included H. M. Gerber, Pres., Louisville Water Co., who gave the Address of Welcome; C. M. McCord, Director, Water Div., Memphis Water, Gas and Light Dept., who gave the Response; A.W.W.A. President Veatch, who discussed the high standards of water quality in the United States; and Joe L. Quinn, Assistant to the President, Hulman Industries, Terre Haute, Ind., who gave an excellent paper on "Labor Relations." The afternoon session was concluded by a Panel Discussion on Labor Relations, led by E. E. Jacobson, Mgr., Lexington Water Co., Lexington, Ky., and assisted by V. A. Appleyard, Mgr., Chattanooga Water Co., Chattanooga, Tenn.; and Jack Boxley, Mgr., Hopkinsville Water and Sewage Dept., Hopkinsville, Ky.

The Tuesday session was presided over by F. C. Dugan, Chairman of the Kentucky-Tennessee I.W.&S.W.A. Featured papers during the day included a discussion of "Present-Day Problems of Financing Water and Sewage Works Improvements," by Grant S. Bell, partner in the firm of Howard K. Bell, Cons. Engrs., Lexington, Ky.; "Historical Development of Sewage Treatment," by F.S.W.A. President Russell; and "Milk Waste Disposal," by Don E. Bloodgood, Prof. of San. Eng., Purdue Univ.

In addition, three panel discussions were included on the program during the day. The first, on present-day problems of financing water and sewage works improvements, was led by G. Reynolds Watkins, Associate in the firm of J. Stephen Watkins, Cons. Engrs., Lexington, Ky.; assisted by J. S. Parker, Cons. Engr. of Nashville, Tenn.; Chester Lucas, of Stein Bros. and Boyce; and John Williamson, Mayor of Mt. Sterling, Ky. The second was a general water works panel discussion, led by W. H. Lovejoy, Supt. of Purif., Louisville Water Co.; and assisted by Clark J. Cramer, Chief Engr., Lexington Water Co.; Earl T. Mitchell, Supt. of Filtration, Water Works, Paducah, Ky.; and S. L. Jones, Prin. Engr., Div. of San. Eng., Tennessee Dept. of Public Health. The third and last during the day was a panel discussion on industrial waste treatment problems, led by W. J. Eldridge, Water Purif. Supervisor, Old Hickory Plant, E. I. duPont de Nemours and Co.; and assisted by Alex B. Davidson, San. Engr., Schenley Distilleries, Inc., Cincinnati, Ohio; Cecil S. Camp, Assoc. Prof., Hydr. and San. Eng., Univ. of Tennessee, Knoxville, Tenn.; and S. L. Jones, Prin. Engr., Div. of San. Eng., Tennessee Dept. of Public Health.

(*Continued on page 66*)

GENUINE COOK WELL STRAINERS
REG. U. S. PAT. OFF.

A. D. COOK, INC.
Lawrenceburg • Indiana
Manufacturers of
Vertical Turbine Pumps, 10 to 10,000 gpm.
Well Strainers, 2 to 40 in.
Water Systems; Shallow Well, Deep Well and Ejector
Write for Sales Literature

DEEP WELL COOK PUMPS
REG. U. S. PAT. OFF.

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CONCRETE PIPE

meets all requirements for water lines

Large scale installations of water lines for many years have proved that incrustation does not occur to impair the carrying capacity of concrete pipe. Taste, odor and dirty water difficulties are minimized. Concrete pipe meets all other essential requirements for water lines including moderate first cost, structural strength and long life.

Picture shows backfill material being spread in trench for compacting to spring line of 69-in. reinforced concrete pipe on Provo River project near Provo, Utah. The concrete in the project includes 10½ miles of 69-in. pipe. Water is carried 36 miles from the Deer Creek Impounding Reservoir to supplement the water supply of Salt Lake City and serve various irrigation needs.

Project was under direction of E. O. Larson, Regional Director, Region No. 4, U. S. Bureau of Reclamation, Denver, Colo. Construction operations in general charge of L. R. Dunkley, Resident Engineer. General contractor for the concrete pipe, Carl B. Warren of Spokane.

AMERICAN CONCRETE PIPE ASSOCIATION

228 NORTH LASALLE STREET, CHICAGO 1, ILLINOIS

(*Continued from page 64*)

The session on the final day included a paper by Maurice L. Miller, Cons. Engr., Louisville, on "Modern Trends in Sewage Treatment Plant Design," and a paper on "Recent Improvements at the Louisville Water Co." presented by Donald Marshall, Assoc., Alvord, Burdick and Howson, Cons. Engrs., Chicago, and B. E. Payne, Chief Engr. of the Louisville Water Co. A panel discussion on modern trends in sewage treatment plant design was led by R. P. Farrell, Director, Div. of San. Eng., Tennessee Dept. of Health; assisted by F. C. Dugan, Director, Div. of San. Eng., Kentucky Dept. of Health; G. Reynolds Watkins; and James K. Latham of Howard K. Bell, Cons. Engrs., Lexington, Ky.

New officers were installed by both associations. The newly elected chairman for the A.W.W.A. section is Gerald R. Kavanagh, Dist. Mgr., Wallace and Tiernan Co., Inc., Knoxville, Tenn. J. W. McCoy, Supt. of Filtration, Munic. Light and Water Plant, Madisonville, Ky., was elected Trustee from Kentucky.

All those registered for the joint meeting were invited to a luncheon at the Louisville Water Filtration Plant, which was followed by an inspection tour of the water works property. Other entertainment for the joint meeting included a special dinner and entertainment by the Louisville

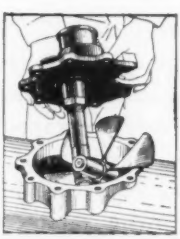
(*Continued on page 68*)

M H

HIGH QUALITY VALVES HYDRANTS

M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.

SPARLING MAIN-LINE METERS



Accurate Measurement of Main-Line Flows

EFFICIENT operation of any water system demands accurate knowledge of how much water is going into distribution lines.

Bulletin 309 on request

SPARLING Manufacturers of WATER MEASURING EQUIPMENT

LOS ANGELES - CHICAGO - CINCINNATI
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FAST FIRST AID

With Dresser Repair Sleeves

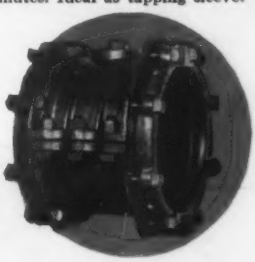
First aid is final aid with Dresser Repair Sleeves. The leak or break is quickly enclosed without interruption of service . . . yet the repair is permanent. Designed for splits, breaks and holes in pipe and pipe joints.

These factory-built "packaged" joints come completely assembled. No complex fitting operations are required in the ditch. Can be installed *Dresser-tight* by any workman.

Order Now for Winter Breaks

Don't be caught short. Stock up now on Dresser Repair Products. Be prepared to handle breaks as they occur. Two typical sleeves are shown at right. Write for catalogs, Forms 441 and 3711. DRESSER MANUFACTURING DIVISION, BRADFORD, PA. Houston Office and Warehouse, 1121 Rothwell St., Sec. 16, Houston, Texas. In Canada, Dresser Manufacturing Co., Ltd., 60 Front St., West, Toronto, Ontario.

Style 82—Adjustable Repair Sleeve. *Low-cost, lightweight* sleeve to fit varying pipe diameters from 4" to 8". Interchangeable sections give adjustability. One man can make a repair with this sleeve in 5 to 10 minutes. Ideal as tapping sleeve.



Style 57—Cast Split Sleeve. Quickly installed. For cast-iron pipe 2" to 12" in diameter. Two or more of these sleeves can be joined together to enclose pipe breaks longer than 8".

DRESSER REPAIR SLEEVES

ONE OF THE DRESSER INDUSTRIES

(*Continued from page 66*)

Water Dept. and the annual dinner-dance. E. E. Jacobson, Manager of the Lexington Water Co., was announced as recipient of the Fuller Award for his excellent work on public relations and active participation for many years in Association affairs. Special entertainment, including a luncheon, was provided for the ladies.

R. P. FARRELL
Secretary-Treasurer

MICHIGAN SECTION MEETING

An attendance of 222—with section membership over 200 for the first time—started the Michigan Section Meeting off right at Bay City on September 18–20. And the promise of that beginning was more than fulfilled by a meeting highlighted by well-prepared papers on timely subjects, an interesting inspection trip, club-room entertainment and the unmasking of a subversive element.

The membership was welcomed to Bay City by J. F. Parkinson, City Mgr., who also paid tribute to E. D. Rich, retired State San. Engr., and Louis Harrison, Supt. of the local filtration plant, for their many contributions to safe and palatable water supplies.

A paper entitled "News of the Field" was presented by John E. Vogt, Div. of Water Supply, Bureau of Eng., State Dept. of Health, to open the technical sessions. The subject matter of this paper, an annual feature of long standing with the Michigan Section, consisted of a review of the important happenings and developments in the water works field in Michigan during the past year. A review of the engineering design and construction data for the Saginaw-Midland Water System was then given by Louis R. Howson, Cons. Engr. of Alvord, Burdick and Howson, Chicago. The manufacturing and laying of reinforced concrete pipe used on the project to carry Lake Huron water a total of 83 miles to Saginaw and Midland was then inspected on a field trip which also included a visit to the Bay City Filtration Plant. Nearly all the means known to the profession

(*Continued on page 70*)

ZECO GREENSAND ZEOLITE

ZECO and HI–ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.
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Clow-National

CAST IRON PIPE AND FITTINGS

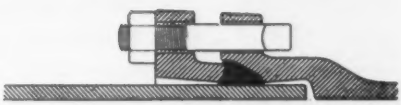
CAN BE FURNISHED TO MEET THE REQUIREMENTS OF ALL EXISTING SPECIFICATIONS

SUPER-deLAVAUD CENTRIFUGALLY CAST IRON PIPE

The standard water bell is the most common type of cast iron pipe joint—popularly known as the "bell and spigot" joint. Available in sizes 3 to 24 inches inclusive, in 12 and 18-foot lengths, and for working pressures up to 250 pounds.

Standard Water Bell

A time-saving, easily installed mechanical joint cast iron pipe now used extensively. Made in all sizes from 3 inches through 24 inches, in 18-foot lengths, and for pressures up to 250 pounds.



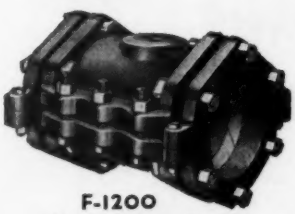
"C-N" Mechanical Joint

Cast iron flanged pipe is widely used for exposed pipe line work, inside and outside of buildings, for conducting water, steam, gas, oil and other fluids. Comes in same sizes and for same pressures as listed above, and in laying lengths, as ordered, up to 18-feet.

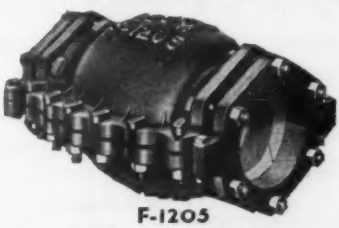
Flanged Joint

CLOW MECHANICAL JOINT SPLIT REPAIR SLEEVE

NO LEADING OR CALKING—ONLY A RATCHET WRENCH NEEDED



F-1200
For Repairing Breaks
Through Pipe Barrel



F-1205
For Repairing Breaks
Through Pipe Joints

It is better to have Clow Split Sleeves on hand and NOT need them than to NEED them and not have them.

JAMES B. CLOW & SONS

201-299 N. Talman Avenue (P. O. Box 6600 A) CHICAGO 80, ILLINOIS

NATIONAL CAST IRON PIPE DIVISION

of James B. Clow & Sons

P. O. Box 2542, BIRMINGHAM 2, ALA.

Everything for the municipal water supply system

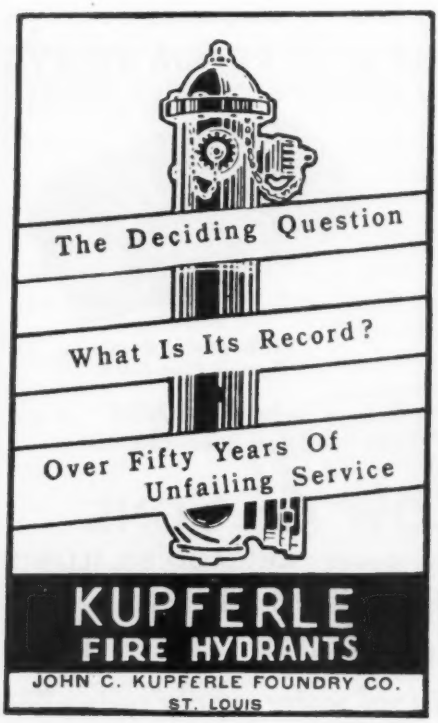
(*Continued from page 68*)

for improving water quality and palatability are available at this plant, including such unusual facilities as ponds for raw water storage, granulated active-carbon filters and carbon dioxide.

The engineering design of a 30-mil. gal. reservoir and booster station for the northeastern section of Detroit's metropolitan area was reviewed by Leo Garrity, Asst. Gen. Supt. of the Detroit Dept. of Water Supply, in a paper entitled "Concrete Water Storage Reservoir for Detroit." The discussion of water storage problems was continued by Edward Alt, Chicago Bridge and Iron Co., in a paper entitled "Elevated Tank Maintenance." Inspection and painting were advocated on regular schedule, with structural repairs made as needed, but only on the advice of competent persons. Discussion by Robert Norris, Cons. Engr. of Ayres, Lewis, Norris and May, Ann Arbor, was particularly timely, including as it did a review of the sad experiences of several towns in Michigan which contracted for the painting and repair of their water tanks without first consulting recognized authorities in the field.

An addition to the literature on corrosion—that constant and persistent problem of every water works operator—was offered by Arthur Smith,

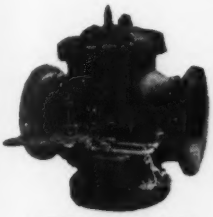
(*Continued on page 72*)



Prevent
Rusting
Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.
Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.
If your tanks and steel structures are not now protected by this proven low cost method, they should be. No obligation. Send for fully descriptive literature today.
RUSTA RESTOR
Division of
THE JOHNSTON & JENNINGS CO.
362 Addison Road, Cleveland 14, Ohio

1879—ROSS—1879

Automatic Valves



ALTITUDE VALVE

Controls elevation of water in tanks, basins and reservoirs

1. Single Acting
2. Double Acting

Maintains safe operating pressures for conduits, distribution and pump discharge

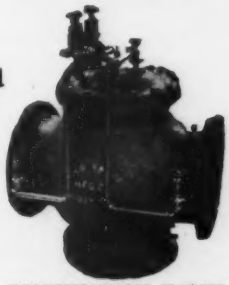
SURGE-RELIEF VALVE

REDUCING VALVE

Maintains desired discharge pressure regardless of change in rate of flow

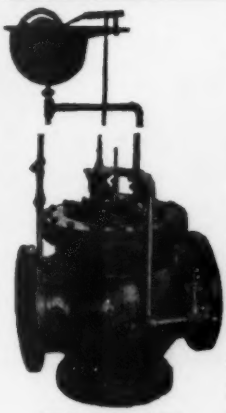
Regulates pressure in gravity and pump systems; between reservoirs and zones of different pressures, etc.

A self contained unit with three or more automatic controls



COMBINATION VALVE

Combination automatic control both directions through the valve.

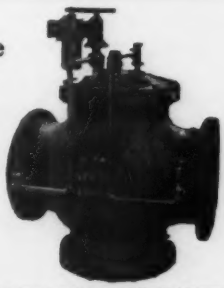


FLOAT VALVE

Maintains levels in tank, reservoir or basin

1. As direct acting
2. Pilot operated and with float traveling between two stops, for upper and lower limit of water elevation.

Electric remote control—solenoid or motor can be furnished



REMOTE CONTROL VALVE

Adapted for use as primary or secondary control on any of the hydraulically controlled or operated valves.

Packing Replacements for all Ross Valves Through Top of Valve

ROSS VALVE MFG. CO., INC., P. O. BOX 593, TROY, N. Y.

(*Continued from page 70*)

Jr., of the Dow Chemical Co., Midland. His paper, "Magnesium for Cathodic Protection of a Municipal Water System," showed that magnesium may be used economically and to advantage in the control of corrosion.

The heating of homes without fires or chimneys, but with the aid of water wells, was the seemingly fantastic accomplishment described by Claude Erickson, Mech. Engr., Board of Water and Elec. Light Comrs., Lansing, in his paper on "The Heat Pump." The unit, which is essentially that of a mechanical refrigerator, can also be used to air-condition or cool the home in the summer. Besides its obvious attraction for the householder, the heat pump, which does not waste the water it uses, is of great interest to those water works officials who have been disturbed by the great consumption of water in standard air-conditioning units.

A paper on the services and methods of operation of "Home Zeolite Service" was presented by Harry McDuff, proprietor of the Oakland Soft Water Service Co., Pontiac; after which some blackboard talks on "Gadgets" that save time and make operation more accurate were given by John Rubbo, Supt. of Filtration, Iron Mountain, and Earl Norman, Supt. of Public Utilities, Kalamazoo.

(*Continued on page 74*)

America's Most Popular Water Works Products

MAKES WATER BRIGHT

STUART CORPORATION BALTIMORE

ACTIVATED ALUM
BLACKALUM
PALMER SURFACE WASH SYSTEMS

Kwik-Way Mixers

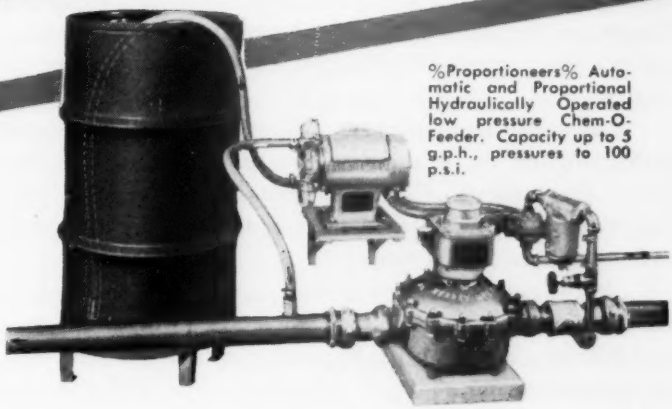
STUART CORPORATION · 516 N. CHARLES ST., · BALTIMORE 1, MD.

ON THE TRAIL OF PURE WATER

FAST OR SLOW

%PROPORTIONEERS%CHEM-O-FEEDER

MAINTAINS THE PACE



%Proportioneers% Automatic and Proportional Hydraulically Operated low pressure Chem-O-Feeder. Capacity up to 5 g.p.h., pressures to 100 p.s.i.

As a hound trails Br'er Rabbit up hill and down, %Proportioneers% Automatic and Proportional Chem-O-Feeder follows a variable water supply. The Chem-O-Feeder, controlled by standard water meter, starts, varies and stops feeding of chemical as the water supply . . . pumped or gravity flow . . . comes on, fluctuates, and tapers off. Every drop of water is correctly sterilized — all guesswork is eliminated. There's no chance of dangerous undertreatmeat, or wasteful overtreatment with resulting disagreeable taste. Full hydraulic operation, utilizing power from the main, insures unfailing water treatment. Reagent head of "See-Thru" plastic reveals the action of the valves and the flow of the liquid fed. %Proportioneers% Chem-O-Feeder will finish your water treating problem . . . economically, dependably. Write for Bulletin SAN-1.

% PROPORTIONEERS, INC. %

61 Codding Street, Providence 1, R. I.

(*Continued from page 72*)

The Section tried its first Saturday morning session on September 20, but found that the attendance dropped from an average of at least 150 at all the other technical meetings to about 35. "Recalcining Sludge as Proposed for the Pontiac Softening Plant" was the offering of Bernel H. Swab of Jones and Henry, Cons. Engrs., Toledo, Ohio; and the paper was discussed by C. W. Gordon, Combustion Eng. Co., New York, and Dr. A. Fisher, Dorr Co., New York. The subject was of especial interest because of the deficiencies of sludge pond disposal methods. A motion picture was used to help explain the proposed process. John M. Hepler, Director, Bureau of Eng., State Dept. of Health, gave a brief but thorough review of constitutional and legislative requirements and limitations for the financing, constructing and operating of a Michigan public water supply in his paper "Enabling and Restrictive Legislation Relative to Public Water Supply in Michigan." The final paper on "New Total Alkalinity Indicators" was presented by Michael Taras, Chemist, Dept. of Water Supply, Detroit.

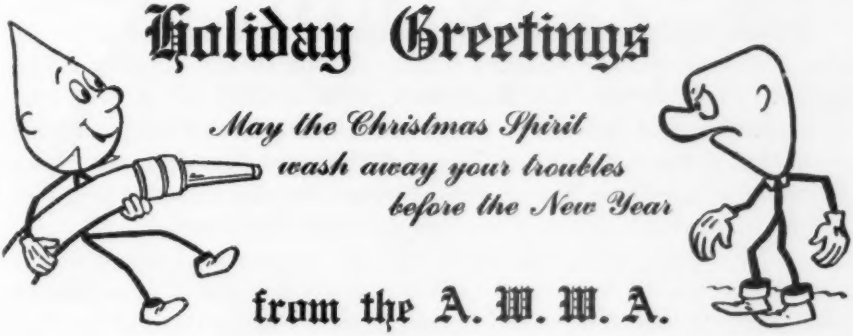
Club-room entertainment was provided by the manufacturer's representatives and the Water and Sewage Works Mfrs. Assn. for the third year. Even though the costs were double those of previous years, the entertainment was a distinct success, and it is the wish of the members that it be continued in the future.

At the annual banquet 57 men and women received the Edward Dunbar Rich Service Award "for completing 25 or more years of meritorious and faithful service in providing and maintaining a safe, dependable and adequate public water supply." The George W. Fuller Award was presented to Anthony Keils, Supt. of the Mt. Clemens water works, for his many years of devoted and inspirational leadership in the water works field.

As the climax of the banquet, a serious problem in international relations was posed by Alexi Krazchenko, U.S.S.R., who was supposedly visiting water plants in this country. By adroitly mixing politics with descriptions and comparisons of water works in Russia and the U. S., he soon had his audience in a frame of mind that did not bode well for his personal safety. His work was so convincing that some of those present walked out on him, but the incident ended in laughter when he discarded his props and disclosed the hoax.

Paul Stegeman, Supt., Midland Water Dept., was elected Chairman for the coming year and John F. Dye, Chief Operator, Water Conditioning Plant, Board of Water and Elec. Light Comrs., Lansing, was elected Vice-Chairman; Raymond J. Faust, Lansing, was elected Secretary-Treasurer; and George Hazey, Chief Operator, Water Filtration Plant, Wyandotte, was elected Trustee.

RAYMOND J. FAUST
Secretary-Treasurer



Man's impatience is going to catapult him into chaos one of these days. It won't be long now, we predict, before he has completely forgotten not only how to enjoy life, but how to live it. And, paradoxically, all his anxious efforts are supposedly directed toward more and more pleasurable leisure time. Can it be that he's forgotten there are only 24 hours in the day—or is that factor, too, slated for early revision?

Once the *Saturday Evening Post* came out on Saturday, morning papers were sold in the morning, this year's cars weren't obsolete by New Year's Day and *Broadway Babies of 1937* didn't win the 1936 Academy Award. Now all that is changed. Beginning, innocently enough, with prepared mustard and soups and with "Quick Quaker Oats," we quickly developed a "pre-and-easy" complex. Next thing we knew, there were presmoked pipes, premixed cocktails, pre-everything-but-baked cakes and biscuits, predigested books and magazine articles, instant coffee, and pressure cookers that steam up a stew before you have time to set the table.

And that was only the beginning. Annoyed with Nature, man recently applied his knowledge of ultrasonic (not merely supersonic) waves to accelerate the aging of whiskey. Dissatisfied with moth balls, crystals and sprays, he has now developed a method of mothproofing wool with DDT while it is still on the sheep. No longer content to wait and pray for rain, he now grabs a bucket of dry ice and goes up after it. Will it be long before some enterprising water works man adds chlorine to the dry ice to pretreat the artificially induced precipitation? And what's to prevent a direct pipeline to the clouds?

Time was when a fertile imagination gave one the pleasure of pioneering the realm of probability; now patent papers wave over every corner of that realm and science rules supreme. Prenatal education? Why not! Precooked beef on the hoof? Any day now! Preboned fish in the sea? Prehooked and precooked! Tomorrow we'll eat before we say grace.

Prepossessed as he is, we have every right to hope and to expect that man's next project will be a prefought war.

(*Continued on page 2*)

(Continued from page 1)

"Save Wheat—Save Meat—Save the Peace" is the slogan for the food conservation drive designed to help Europe through another critical winter. Frost, drought and floods have taken a heavy toll of food crops in western Europe, where the wheat and rye crop is 200 million bushels lower than it was last year, itself a year of hunger. Already meager bread rations have been cut in France, Italy, Holland, Sweden and other countries. Unrest is growing. And cold weather aggravates the situation.

What happens in Europe in the next six months is of immediate, decisive concern to all Americans. It is not simply a matter of humanitarianism—although that alone should be enough for a country that has traditionally helped those in need. Actual self-interest demands that we back up with food Europe's attempts at reconstruction, that we relieve human misery if only to prevent the consequences of irresponsible actions people will take in desperation. Secretary of State George C. Marshall, in discussing the food program, said:

> During this critical period in world affairs, food is a vital factor in our foreign policy. And the attitude of Americans towards food can make or break our efforts to achieve peace and security throughout the world.
>
> From this time on, at least until the end of winter, every man, woman and child in this country will exert a direct, personal influence on the course of international affairs.
>
> The connection between the individual American and world affairs is unmistakably clear—our foreign policy has entered the American home and taken a seat at the family table.

Hungry people cannot achieve the democratic self-government essential to make secure our own peace and freedom. Both for humanitarian and for selfish reasons, we must help the nations of Europe get back on their feet.

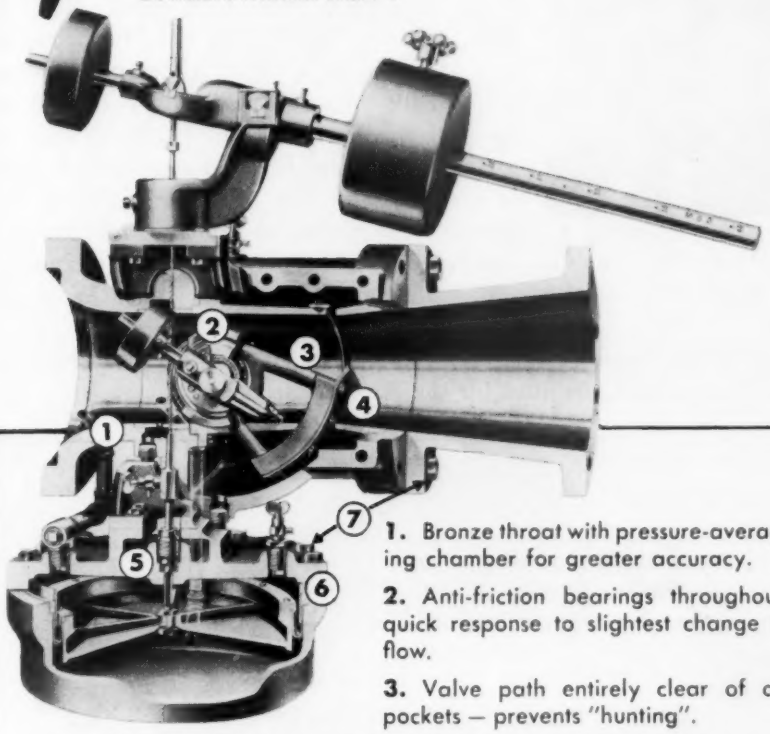
Missing Your November Journal?

The editors of the Journal have just learned that a group of about 100 address labels intended for the mailing of the November issue went astray en route to the printer. Unfortunately there is no way of knowing which subscriptions have been affected. We regret the inconvenience to these readers and request that, if they have not received their November copy by the time this issue arrives, they notify this office immdeiately. A postcard will do.

(Continued on page 4)

7 GOOD REASONS

Why more engineers, who demand the best in water works rate controllers, are specifying . . . "equal to Builders Model RCE":



1. Bronze throat with pressure-averaging chamber for greater accuracy.

2. Anti-friction bearings throughout: quick response to slightest change in flow.

3. Valve path entirely clear of air pockets — prevents "hunting".

4. Balanced control valve of arched design — will not buckle.

5. Hardened stainless steel piston rod . . . eliminates corrosion and bending.

6. Exclusive molded rubber piston seal won't bind, catch or reverse.

7. And something extra,—Everdur bronze bolts for easy maintenance.

For Bulletin 321B, address Builders-Providence, Inc. (Division of Builders Iron Foundry), 25 Codding Street, Providence 1, R. I.

BUILDERS PRODUCTS

Venturi, Propeloflo and Orifice Meters • Kennison Nozzles • Venturi Filter Controllers and Gauges • Conveyoflo Meters • Type M and Flo-Watch Instruments • Wheeler Filter Bottoms • Master Controllers • Filter Operating Tables • Manometers • Chronoflo Telemeters

BUILDERS PROVIDENCE
Instruments

(*Continued from page 2*)

Alden W. Miller has been elected to the A.W.W.A. Board of Directors by the newly organized Arizona Section for the 1947–1950 term. A Representative and Senior Salesman of the Johns-Manville Sales Corp., Phoenix, Ariz., Miller was born in Medford, Mass. in 1898, and was educated at the Massachusetts Inst. of Technology. After an interval of service with the Army Field Artillery in 1918, he received his B.S. degree in 1920 and went on to serve as Chem. Engr., Foreman and Supt. of Construction with the Three Millers Co., Boston. He served in similar capacities with the York Ice Machine Co., Los Angeles, and finally accepted a position as Sales Engr. with the Johns-Manville Sales Corp., with which he is still affiliated, in 1927.

An Active Member of the Association since 1934, Miller was Chairman of the Organizing Committee for the Arizona Section.

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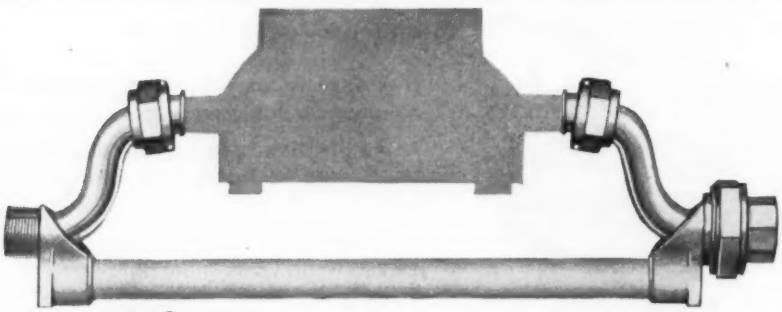


SAVE TIME AND TROUBLE

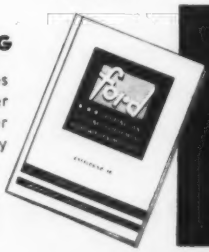
...with This Permanent Meter Setter!

Ford Linesetters save many expensive delays by establishing a permanently aligned spacing for water meters. Also serve as electrical bond around meter. Made in plain and valve types for basement or outdoor settings. Start saving meter changing costs *now*, with Ford Linesetters.

FREE CATALOG

New Ford catalog describes Linesetters and many other time saving devices for water utilities. Send for your copy today.

FORD METER BOX CO.
WABASH, INDIANA



FORD
LINESETTERS

CALGON* works wonders with water...

threshold treatment with CALGON

...controls corrosion

in filters, mains, meters and service lines, even with water having pH values as low as 5.2.

...inhibits scale formation

in filters, mains, meters, service lines and hot water heaters, although hardness may be as high as 82 grains, and water temperature as high as 220° F.

...eliminates red water

though as many as 8 ppm of dissolved iron or manganese may be present.

...stabilizes water following lime softening

preventing after-precipitation of calcium carbonate on the filter sand, in mains, meters or service lines, although water may have a pH value as high as 11.0, and although the softened water is later mixed with water having excess alkalinity.

We will be glad to send you full information about Calgon and the advantages it offers in the treatment of your own supply.

*T. M. Reg. U. S. Pat. Off.

HAGAN HALL BUROMIN CALGON

calgon, inc.

A SUBSIDIARY OF HAGAN CORPORATION

HAGAN BUILDING PITTSBURGH 30, PA.

(*Continued from page 4*)

If names make news, we've got some. When Damon Runyon and Lloyd George applied for A.W.W.A. membership on the same day in October, we had to be sure that there was a precedent for that sort of thing. The fact that Runyon identified himself as a consulting engineer from Longmont, Colo., and that George said he was a salesman for the Mueller Co. in Indianapolis didn't alter the incredulity greatly. After all, we studied history and read the papers too.

When a hurried thumb-through of the files revealed two John Adams', a John Brown, Jimmy Walker, James Stewart, Robert Taylor, Samuel Johnson and no less than two Walter Scotts on our roster, however, we were a little more willing to take the thing seriously. And when Henry Aldrich, R. N. (obviously "Dick") Tracy, T. H. (certainly "Tom") Collins, J. L. (undoubtedly "Jack") Horner, and even a Babbitt and a MacDuff, showed up, we lost all suspicion that our "nomenclatured" leg (*see* October News of the Field, p. 1) was being pulled.

At least we have only one Mrva, and his name is Andrew E.

A "critical area" for ground waters has been established in parts of Middlesex and Monmouth Counties, N.J., by the Div. of Water Policy and Supply of the New Jersey Dept. of Conservation, in order to control the diversion of water from wells by private owners. This is the first of a number of critical areas to be established in the state under the authority of Chapter 375, Laws of 1947. In announcing the move, Comr. Morgan F. Larson explained that increasing diversion from wells was exceeding the natural replenishment of ground waters in the area, thereby threatening to exhaust the supply or render it unfit for use by permitting sea water intrusion. Well owners in the area were urged to file statements, in accordance with procedure outlined by the division, in order to protect their rights. Requests for copies of the statement form may be obtained from the Div. of Water Policy and Supply, 28 W. State St., Trenton 8, N.J.

(*Continued on page 8*)

Cut Your Packing Costs!

by using

MABBS RAWHIDE PACKING

on your Pumps and Valve Stems

Frictionless — it saves power; lasts for years

Free Sample and Literature Upon Request

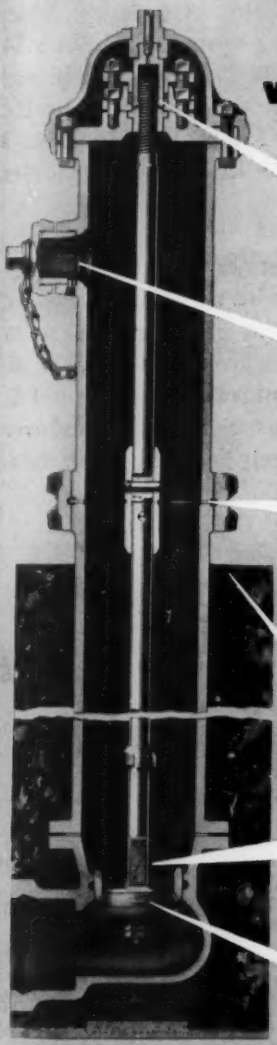
MABBS HYDRAULIC PACKING CO.

Incorporated 1892

431 S. Dearborn St. Chicago 5, Ill.

6 Reasons

WHY YOUR COMMUNITY SHOULD STANDARDIZE ON SAFETOPS



Quick Action Mechanism

Swift response to the wrench is assured by the simple, straight-line operating mechanism. There is no risk of the stem nut sticking. Thorough lubrication is amply provided for, and a drainage slot in the stem nut allows water or sediment to escape.

Full Flow at the Nozzle

Full pressure is there when needed, because of the correctly-shaped, easy curve of the elbow, the larger standpipe diameter, the smooth interior surface and the bell-shaped nozzle entrance which prevents eddy losses.

Safety Breakable Section

When a Safetop is struck a smashing blow which no hydrant could withstand, only the Safety Breakable Section gives way. Above and below the break, the hydrant remains intact. One man with only $10 worth of replacement parts can repair the hydrant within half an hour.

Unaffected by Frost Upheaval

There is no flange at or near the ground line. Frost upheaval cannot exert pressure on the standpipe; there is no danger of springing the joint at the main.

Won't Freeze Up

Double positive acting drain valves assure drainage of the standpipe when the main valve is closed . . . prevent danger of damage or failure due to freezing.

Geyser-Proof

Pressure from the main keeps this valve tight. In case of collision damage, there would be no geyser . . . no flooding . . . no need to shut off the water supply while this hydrant is being repaired.

THE KENNEDY VALVE MFG. CO.
ELMIRA, N. Y.

KENNEDY *Safetop* HYDRANT

(*Continued from page 6*)

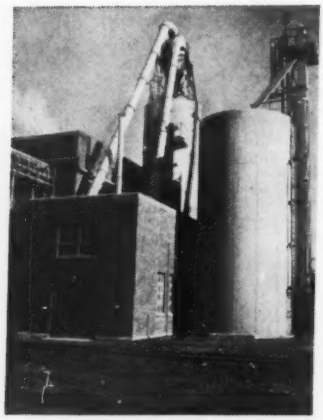
Lead hygiene is the general subject of six papers delivered by prominent authorities at the Seventh Annual Congress on Industrial Health of the American Medical Assn., arranged in co-operation with the Lead Industries Assn., and held in Boston on Sept. 30, 1946. The papers, which have been published in *Occupational Medicine,* have been reprinted in a 54-page booklet entitled "Conference on Lead Poisoning." They include such titles as "Facts and Fallacies Concerning Exposure to Lead," "Public Exposure to Lead" and "Industrial Exposure to Lead." The booklet is available through the Lead Industries Assn., 420 Lexington Ave., New York 17, N.Y., on request, for 25¢.

Surplus metals, valves and fittings—about $600,000,000 worth—have been disposed of during the last three years by the War Assets Administration. The material represents 85 per cent of the metals so far declared surplus. Originally acquired at a cost of over $700,000,000, the material has been used to help bridge the present gap between supply and demand. Most of the valves and fittings were of nonstandard types, and were and are being disposed of by competitive bid, largely for their scrap value.

(*Continued on page 10*)

Be Sure to Specify CYANAMID

SULFATE OF ALUMINA



Partial exterior view of Cyanamid's new alum plant at Hamilton, Ohio. As at other Cyanamid plants, rigid control methods assure highest quality Sulfate of Alumina.

CYANAMID'S uniform high quality of product assures you:

maximum removal of taste and odor

maximum freedom of flow

maximum pH range of precipitation (much wider than other coagulants)

minimum corrosion of equipment (much less than other coagulants)

no clogging of dry feed machines

Your inquiries are welcome. Address our nearest office.

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HELLIGE
TURBIDIMETER

A TURBIDIMETER WITHOUT STANDARDS

The Hellige Turbidimeter is based on the comparison of a beam of light with the Tyndall effect produced from the lateral illumination of the specimen by the same light source. It is the only instrument of its kind which does not require any standard suspensions and which is unaffected by fluctuations in the line voltage. ACCURATE, FOOLPROOF and UNIVERSAL, this precise instrument is not only ideal for turbidity and sulfate determinations of water, but for measurements of any suspended matter in general. Turbidity measurements can be made down to zero-turbid water.

Those who are familiar with the cumbersome long tubes of older apparatus and the inconvenience encountered with older methods, will appreciate the handy, short tubes of the Hellige Turbidimeter and the many other features which enhance accuracy, speed and reliability.

WRITE FOR BULLETIN No. 602(T) which also describes Hellige Comparators employing Permanent Glass Color Standards for pH control and all popular water tests based on A.P.H.A. and A.W.W.A. methods.

HELLIGE

INCORPORATED

3718 NORTHERN BLVD., LONG ISLAND CITY 1, N.Y.

(*Continued from page 8*)

Willing Water must have had a chat with Donald Duck and decided that this *Saludos Amigos* business was good stuff. At least we found a full page of evidence in the July-August issue of the Argentine publication *Revista de Obras Sanitarias de la Nacion* that our Willie had been A.W.O.L. sometime last summer for a quick trip to Buenos Aires. Not only that, but, unless his poor Spanish can be blamed, he was traveling under an assumed name, for *Señor Agua Corriente* sounds very un-Willing to us, and besides there was no evidence of his A.W.W.A. badge in the pictures.

Willie hasn't confessed yet whether he conceived his excursion as a spree or a mission. Actually we think the mission idea a good one and would have been glad to have arranged proper passage for him without an alias. As a matter of fact, aside from being a little put out about not being consulted beforehand, we're quite proud of him for his proficiency in another tongue.

Less spectacular, though equally inter-American, have been Willie's regular assignments in Canada, where, particularly at Halifax, N.S., he is well known as a willing worker. Just last October, in *Pipeline Post,* publication of the Halifax Public Service Commission, he went so far as to don a skirt to write a feminine column entitled "Powder Puffs." Among other activities there, he sponsors a baseball team and runs the employees' social club.

Fred H. Brune, after representing the Rensselaer Valve Co. for forty years, has joined with H. G. Roberts, who has been with that company for fifteen years, in forming the Roberts and Brune Co. They will act as sales representatives in northern California and Nevada for their former employers and for the Atlas Mineral Products Co., the Ford Meter Box Co., the Payne Dean Co. and Lee Hydraulic Co. Brune's last position with Rensselaer was as Sales Mgr. of the Chicago Branch, and Roberts was District Mgr. in San Francisco.

(*Continued on page 12*)

ZECO GREENSAND ZEOLITE

ZECO and HI-ZECO Greensand Zeolite for water softening, filtration and iron removal. ZECO Manganese Zeolite for iron and manganese removal. Corexite mineral for corrosion and water stabilization.

ZEOLITE CHEMICAL CO.

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"We have cut our 'unaccounted-for' water 30% since changing to Badger Meters"

". . . and our revenues have shown a marked increase," continues the City Clerk of a well-managed industrial city. "Badger Meters are giving the city uninterrupted service from year to year at a minimum cost."

Millions of satisfied users of Badger Meters in over 5,000 communities prove that "It pays to BUY BADGER."

BADGER METER MFG. CO.
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ACCURACY · LOW COST MAINTENANCE · DURABILITY · DEPENDABILITY

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(*Continued from page 10*)

North Carolina waters are described in a report issued by the U.S. Geological Survey in co-operation with the North Carolina Board of Health. Entitled "Public Surface Water Supplies in North Carolina: Descriptions and Chemical Character," the report was written by William L. Lamar and Felix H. Pauszek. Information is given on 116 public surface water supplies serving 139 communities in the state, including the population served, ownership of the supply, source, and the treatment that the water receives. A total of 118 complete chemical analyses are reported for the finished waters delivered to consumers. The 41-page report may be obtained without charge from the Div. of San. Eng., North Carolina State Board of Health, Raleigh, N.C., or from the U.S. Geological Survey, P.O. Box 711, Raleigh, N.C.

Arthur B. Morrill, who has spent a number of years in the Orient with the U.S. Public Health Service, is returning there after a short stay at his home in Detroit. As before, he will be working with the Chinese Ministry of Health to promote public health through the use of modern water and sewerage systems. This time, however, he will be assigned as Cons. San. Engr. by the World Health Organization of the United Nations.

(*Continued on page 14*)

The Deciding Question

What Is Its Record?

Over Fifty Years Of Unfailing Service

KUPFERLE
FIRE HYDRANTS
JOHN C. KUPFERLE FOUNDRY CO.
ST. LOUIS

3 *Money, Time and Labor Saving Features of*

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CAST IRON PIPE

LAID WITH ONLY WRENCHES

NO CAULKING MATERIALS

NO GASKETS. NO BELL HOLES TO DIG.

For water supply, fire protection systems, sewage disposal systems, industrial, and irrigation. Flexible.

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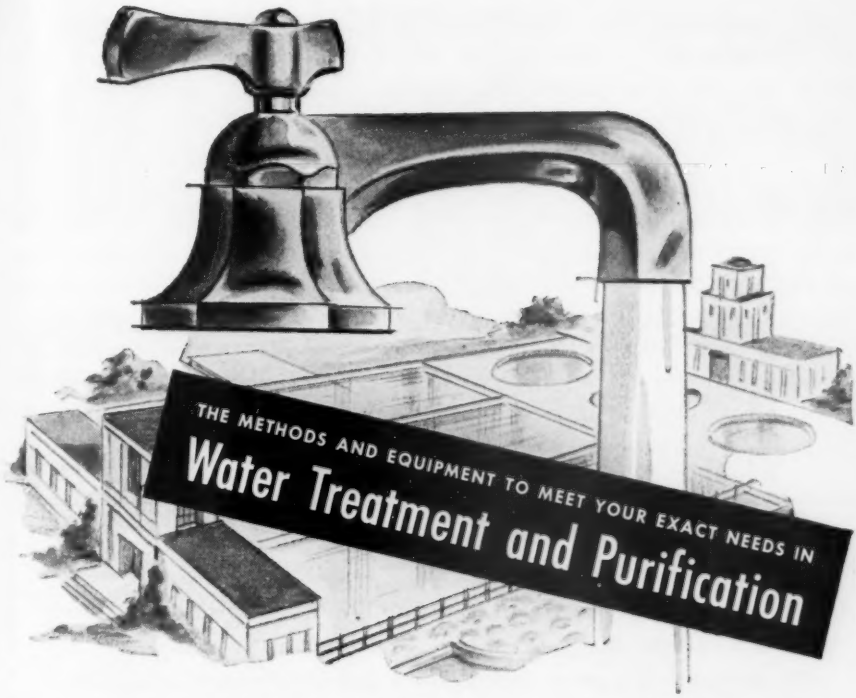

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THE FLOCSETTLER—has rapid mix zone, gentle agitation zone, and vertical settling tank. For small cities, institutions, camps, and industries. Write for Bulletin 256.

THE FERROFILTER—economically and completely removes iron and manganese and accompanying carbon dioxide. Write for Bulletin 252.

CONTACT AERATOR BACKWASHABLE—a rotary aerator which applies raw water over shallow trickling filter bed . . . designed for back-flushing. Send for Bulltein SAN 2029.

MIXING EQUIPMENT—*Downflo Flocculation Unit*, mixes large volume of water at low velocity. *Recarb Unit*, mixes CO_2 with recirculated liquor drawn from all parts of tank. *Downdraft Aerator* dispels odors and oxidizes tastes with fine bubble aeration. *Rapid Mix Unit*, for continuous blending of coagulant with raw water. Equipped for aerating. Send for Bulletin 255.

Also Zeolite Softener, Vertical Pressure Filter, and sludge removal equipment for sedimentation basins.

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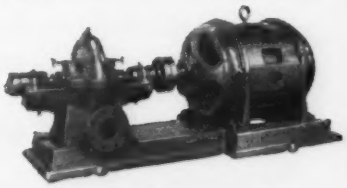
As pioneers in the invention and manufacture of water transfer and deep well pumps, American Well Works has thousands of installations throughout the world filling exacting assignments over long periods.



Horizontal Double Suction

Split case design cast in close grained grey iron. Enclosed type bronze impelier, with all water passages hand finished and exterior surfaces machined. Also Single and Two Stage Centrifugals, Axial and Mixed Flow, and Deep Well Turbine Pumps in a wide range of capacities and heads.

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Pumping, Sewage Treatment, and Water Purification Equipment
RESEARCH • ENGINEERING • MANUFACTURING

Offices: Chicago • New York • Cleveland • Cincinnati • Kansas City • Sales Representatives throughout the World

(*Continued from page 12*)

A casualty of war was the library of Finland's excellent and keenly scientific-minded technical institute, Teknillinen Korkeakoulu. In his recent trip to that country for the American Friends Service Committee, Arthur E. Morgan received an appeal from the institute for gifts of scientific and technical books and periodicals to help the Finns overcome the lack of technical library facilities, which is proving a very serious handicap to the remarkable efforts for recovery they are making. Dr. Morgan points out that such contributions would be a practical act of friendship to a nation that holds America in high regard.

Any such gifts should be marked for the Institute of Technology, Helsinki, and sent to the Legation of Finland, 2144 Wyoming Ave., N.W., Washington, D.C. The Finnish Minister will arrange for them to be shipped to Finland.

Christmas —

Why not celebrate it this year in the true holiday spirit? Invite a hungry European family to dinner as your guests. Invite them in your name—or invite them in the name of a friend.

No, they won't be able to come in person, but you can send them CARE food packages—enough in each package for a full month of supplementary meals for a family of four. Or you can send any of the other CARE packages—baby food, infant food, blanket, cotton, woolen, knitting wool, household linen, layette —all so desperately needed in Europe today.

Full cost only $10 each; delivery guaranteed.

The CARE Christmas PLAN

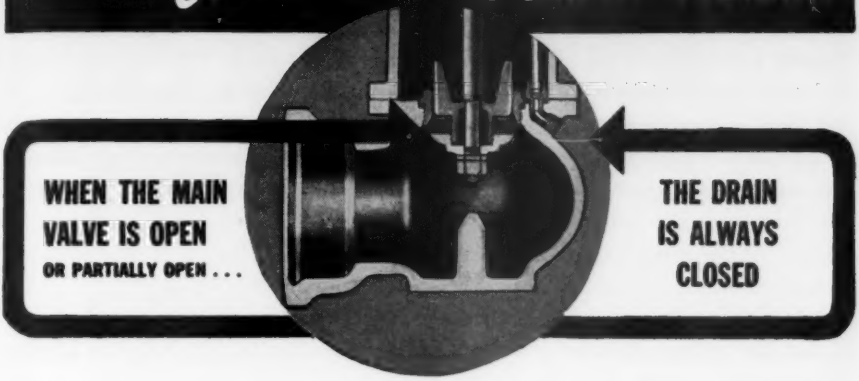
Instead of giving the usual Christmas gift this year, help feed a family in Europe for a month. CARE will send a handsome Donor Certicate to anyone you designate, informing them that you have sent a food package to a needy European family in their name.

Just send your order, with $10 and the name and address of the person you wish to receive the Donor Certicate, to CARE, 50 Broad St., New York 4, N.Y.

In no other way can you send so much for so little.

(*Continued on page 16*)

LEAKAGE THRU DRAIN *can never undermine* A SMITH HYDRANT



The Smith Fire Hydrant is so designed that the drain is open only when the main valve is completely closed. Water under pressure cannot pass through the drain in the event that the main valve is improperly closed, open or partially open.

16

FIRE HYDRANTS
GATE VALVES
CHECK VALVES
INSERTING VALVES
TAPPING SLEEVES AND VALVES
WATER SERVICE BRASS GOODS

THE A. P. SMITH MFG. CO.

EAST ORANGE NEW JERSEY

FLOOR STANDS
INDICATOR POSTS
TAPPING MACHINES
INSERTING MACHINES
PIPE CUTTING MACHINES

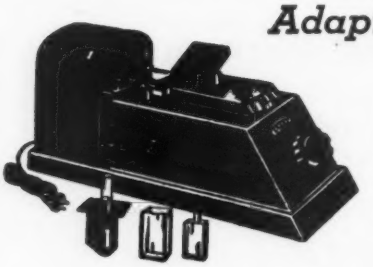
(*Continued from page 14*)

Psychic static must have permeated the atmosphere of Phoenix, Ariz., last spring, for the attempts of Meter Reader Milton M. Lemieux of the city water department to develop an armchair system of recording meter registrations were a disastrous failure. Evidently convinced that his experience had placed him in psychic harmony with the meters along his route or perhaps because he was afflicted with bunions, Lemieux granted himself a two-month vacation with pay, turning over to the unadvised department the product of his psychic conjecture. For the months of May and June, everyone was happy, most of all Lemieux. But when conscience or curiosity impelled him to return to the materialistic method in July, it was his imagination that took a holiday. No sooner had the July bills gone out than protests began to swamp the department—protests against increases in consumption of up to 400 per cent. One enraged householder presented bills of $6.62 for May, $8.97 for June and $33.46 for July.

It didn't take Supt. Joe Thurman long to discover the cause. Perhaps, in fact, the young Milton's arithmetic teacher should really share the blame. At any rate, there is real proof here that *le mieux* (the best, that is) is none too good.

(*Continued on page 18*)

KLETT SUMMERSON
ELECTRIC PHOTOMETER



Adaptable for Use in Water Analysis

Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined

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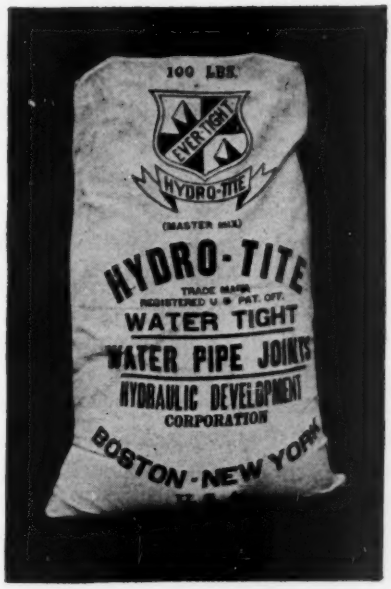

TESTED FOR OVER 30 YEARS

For more than thirty years water works superintendents have been using Hydro-tite for joining bell and spigot pipe. They have found that this self-caulking, self-sealing compound costs less to buy, requires less labor, makes tighter joints and withstands the effects of time, strain and vibration. Send for data book and sample.

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Main Sales Office: 50 Church St., New York, N. Y.

Works: West Medford Station, Boston, Mass.

(*Continued from page 16*)

James E. Gibson, 1874–1947

A long and useful career in the water supply service was terminated by the death of James E. Gibson, Manager and Engineer of the Charleston, S.C., Water Department. A Past-President of the Association, he began his active participation in A.W.W.A. affairs in 1925, when he was elected Trustee. In 1927 he rose to Vice-President and in 1928 became President. He was a member of the Executive Committee and was awarded the Diven Medal the next year. Other activities followed, and in 1940 he was made an Honorary Member.

A graduate in 1894 of the University of Arkansas, with a bachelor's degree in Mechanical Engineering, Gibson began his career as Assistant Engineer with the firm of Jay M. Whitman, Consulting Engineers of Philadelphia. He then accepted a post as Mechanical Engineer with the Camden, N.J., plant of the Moro Phillips Chemical Company (the present General Chemical Company). From 1897 to 1917 he served both as Principal Assistant Engineer with the American Pipe and Construction Company and as Manager of the Waukesha, Wis., Water Works. During this time he made numerous studies and designs for water supply systems and hydroelectric plants over a wide area. He was then appointed Manager of the Charleston, S.C., Light and Water Company during the final negotiations for its purchase by the city, and remained as Manager and Engineer of Water Works after the transfer was completed, and, among other activities, was instrumental in arranging a 25-mgd. supply for a new pulp mill of the West Virginia Pulp and Paper Company.

Gibson wrote a number of professional papers on the operation, construction, management and valuation of water supplies and other public utilities, including a history of the Charleston water system. In addition to his many contributions to the literature, he has also belonged to many technical and professional associations, which he served actively and faithfully.

(*Continued on page 20*)

GENUINE COOK WELL STRAINERS
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Manufacturers of
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DEEP WELL COOK PUMPS
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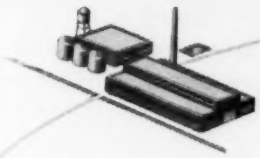
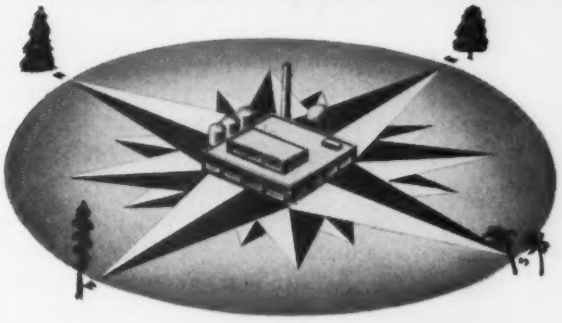
OUR PLANTS BLOOM THE YEAR 'ROUND



...IN YOUR BACK YARD!



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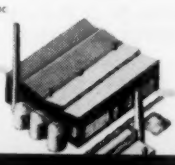


(*Continued from page 18*)

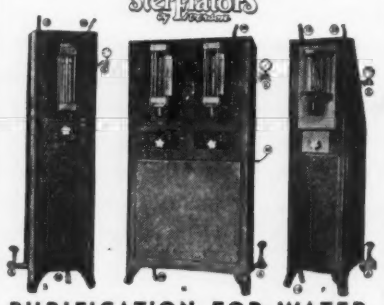
WANTED—an engineer. A well-established midwestern manufacturer, an Associate Member of the Association, requires the services of a graduate engineer experienced in the design of sludge blanket type clarifier-softeners. Those interested should detail their experience, relevant personal information and salary expected in a letter addressed to the Managing Editor of the JOURNAL, referring to Item 12471.

Engineering draftsmen are needed by the Bureau of Reclamation for its heavy construction projects in the arid regions of the West. Currently and until further notice applications are being accepted for Grades SP–6, SP–7 and SP–8, which offer starting salaries from $2644.80 to $3397.20 and require from 4 to 5 years of total drafting experience. These grades also require 9 to 12 months of specialized experience in any of the optional branches for which the applicant is being rated: architectural, cartographic, civil, electrical, mechanical, structural or general. Application Form 57 and Card Form 5001 ABC, which are needed for application, may be obtained from the Executive Secretary, Central Board of U.S. Civil Service Examiners, Bureau of Reclamation, Denver Federal Center, Denver, Colo.

(*Continued on page 22*)

FEEDS — METERS — MIXES
CHLORINE GAS ACCURATELY

SterElators by Everson



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Everson SterElators Utilize a 24″ Water Gauge Vacuum and Visible Flow Meters, with Wide Ratio Ranges of Capacities: 10 to 1, 50 to 1, 110 to 1.

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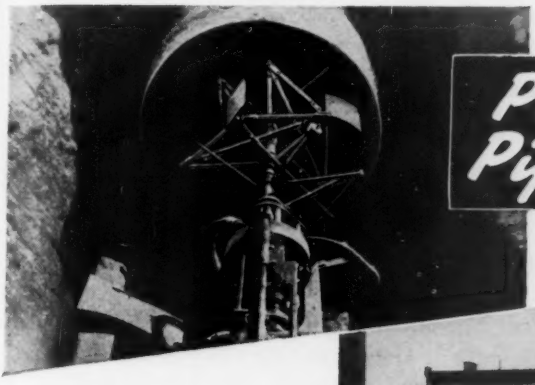
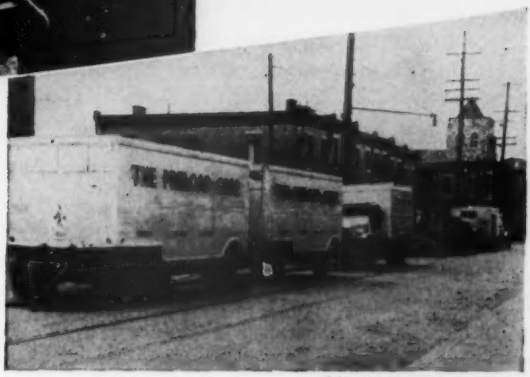
M & H products, including pipe line accessories, are well known for high quality of material and expert workmanship. They are made according to standard specifications and have been used for many years throughout the country. Write for Catalog No. 34. Address M & H Valve and Fittings Company, Anniston, Alabama.



Pipe lining machine entering 48" pipe, Philadelphia, Pa.

PRELOAD Pipe Lining



Only PRELOAD Equipment can Produce PRELOAD Results - - -

Pipe lining surface equipment, Philadelphia, Pa.

Backed by long experience in the application of pneumatic cement mortar linings PRELOAD PIPE LINING is now done by specially designed equipment embodying a number of unique features.

The PRELOAD Cement Pipe Lining Machine utilizes material which has been pre-mixed dry, above ground, and is conveyed to it under pneumatic pressure. The mixture is hydrated by water jets at the nozzle immediately prior to being "shot" against the pipe wall with a velocity of over 300 feet per second. The thickness of the cement mortar lining is closely controlled by special mechanism. The cement mortar lining is then smoothed by four graduated spring-loaded trowels attached to pantograph troweling arms.

The surface equipment is designed to operate with a minimum of disturbance to traffic and surrounding business and residential districts; is highly mobile and provides every facility for carrying forward the below-ground pipe lining operation with speed, efficiency, and economy.

PRELOAD Pipe Lining can give a new economic lease of life to old water mains 24" or larger; conserve and forestall capital investments in new pipe lines; improve service by increasing fire fighting, industrial and domestic water pressure; and create new water revenues through increased pipe line capacity.

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Preload Pacific Corporation
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The Preload Co. of Canada, Ltd.
Montreal—Toronto—Halifax

(*Continued from page 20*)

Edwin Madison Allen, 1872–1947

Edwin Madison Allen, formerly President and Chairman of the Board, and until the time of his death a Director of the Mathieson Alkali Works, died at his home in Rye, N. Y., on November 2, 1947. He was 75 years old.

A graduate of Purdue Univ. with a B.S. degree in Mechanical Engineering, he began his career as an apprentice machinist while taking graduate work, also at Purdue, towards the degree of Mechanical Engineer, which he received in 1899. He then began his extensive activities in industry, rising very rapidly to become Secretary-Treasurer and then President of the Fayette Manufacturing Company.

In 1906, he formed the American Refractories Company in Los Angeles, and shortly afterwards formed the affiliated Austro-American Magnesite Company, with a plant in Austria. In 1919 he joined the Mathieson concern as its President, undertaking an almost complete rehabilitation of the company's operations, including a seven-year building program and the formulation of a plan for selling the company's chemical products directly to the consumer—at that time a revolutionary idea in the heavy chemical field. He also formed the traffic and technical service departments of the company and extended its research and development facilities. In 1938 he was made Chairman of the Board, and continued in the two posts until his retirement as President in 1944. Two years later, he also resigned as Chairman.

He was a director of several large corporations and served three terms as President of the Manufacturing Chemists Association. During both World Wars, he served as Chief of the New York Procurement Division of the Army Chemical Warfare Service, and in World War II he also served as a member of the Army and Navy Munitions Board.

Franchise taxes of utilities in Little Rock, Ark., are to be raised sharply by a measure voted by the city council. Power taxes will be increased from $39,000 to $100,000, gas from $37,500 to $55,000, and telephone from $37,500 to $45,000 if, after a public hearing, the measure is validated by a city ordinance. Tax payments generally are 50 per cent higher than for 1946 and prior years. Only the municipal water works system has been spared, and even it has made a $30,000 "gift" to the city this year, in place of the annual tax levy of $25,000 which was previously imposed. The system is now nominally tax-free.

(*Continued on page 44*)

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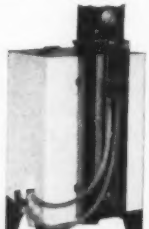

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CHANGES IN MEMBERSHIP

NEW MEMBERS

Applications received October 1 to 31, 1947

Allinson, John W., Supt., Water Works, Williams, Iowa (Oct. '47)

Arbuckle, Mortimer M., Chief Operator, Canadian River Gas Co., Channing, Tex. (Oct. '47)

Archibald, H. E., Township Engr., Township of Teck, Kirkland Lake, Ont., Can. (Oct '47)

Asbury, W. D., Asst. Supt., Water Dept., Tyler, Tex. (Oct. '47)

Berry, Ralph O., Mgr., Water Dept., 504—7th St., Moundsville, W.Va. (Oct. '47)

Broadhurst, W. L., Dist. Geologist, U.S. Geological Survey, 302 W. 15th St., Austin, Tex. (Oct. '47)

Burbank, Nathan C., Jr., Instructor, Oklahoma A&M College, College Courts, Stillwater, Okla. (Oct. '47)

Burton, Nelson E., Supt., Water, Gas & Sewage, Box 911, Sunray, Tex. (Oct. '47)

Byars, Gus L., Supt., Water Dept., Tucumcari, N.M. (Oct. '47)

Cabrera, Luis, c/o City Water Plant, 321 S. 16th, Edinburg, Tex. (Jan. '47)

Chapman, J. W., Supt., Hurricane, W.Va. (Affil. Oct. '47)

Crenshaw, T. B., Supt., Power & Distr., Emergency Export Corp., Box 2000, Dumas, Tex. (Oct. '47)

(*Continued on page 30*)

The Smith-Blair Repair Clamp is especially flexible . . . so much so that it easily adjusts itself to any pipe shape . . . being of "non-rigid" design it cannot distort or crush thin-walled or weakened pipe. On standard, riveted, O. D., cast iron or asbestos cement pipe it's the "snuggest-fitting" leak clamp yet!

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Los Angeles, Crane Co. (Los Angeles Cty.)
Los Angeles, Western W. Wks. Sup. Co. (Los Angeles Cty.)
San Bernardino, Crane Co. (Riverside & San Bernardino Ctys.)
COLORADO—Denver, Thompson Pipe & Steel Co., also part of Wyoming and New Mexico.
GEORGIA—Thomasville, Davis Meter Repair Co. for Miss., Ala., Fla., & Georgia.
IDAHO—(See Oregon).
KANSAS & MISSOURI—Kansas City, Kansas, F. L. Carswell Mfg. Co.
MICHIGAN—Birmingham, Ellis & Ford Mfg. Co. for Mich., Ohio, Ill., Ind., & Wisc.
MONTANA—(See Oregon).
NEBRASKA—Lincoln, Western Supply Co.
NEW YORK—Brooklyn, J. G. Pollard Co., Inc. for N. Y., N. J., Penn., New England States.
OKLAHOMA—Tulsa, Crane Co., (East Okla.) Okla. City, Crane Co., (West Okla.)
OREGON—Portland, Waterworks Supplies Co. for Ore., No. Idaho, Washington Counties of Pacific, Cowlitz, Skamania, Klickitat.
SO. CAROLINA—Sumter, Cities Supply Co., Inc. for Virginia, No. & So. Carolina.
TENNESSEE—Memphis, Viking Supply Co.
TEXAS—Waco, Rohan Co. (entire state).
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(*Continued from page 28*)

Cullen, Maude K. (Mrs.), Owner, Cullen Water Works, New Cumberland, W.Va. (Affil. Oct. '47)

Cunningham, D. R., Operator & Owner, Water Works, Gunter, Tex. (Oct. '47)

Cypert, Roy P., San. Engr., State Dept. of Health, Austin, Tex. (Oct. '47)

Darvill, D. H., *see* Pietermaritzburg, City of

Davenport, George L., Jr., Hydr. Engr., Atchison Topeka & Santa Fe Ry., 121 E. 6th St., Los Angeles 14, Calif. (Oct. '47)

Dunphy, W. W., Water Supt., Box 65, Clyde, Kan. (Oct. '47)

Eddins, Earl W., Gen. Foreman, Utilities Dept., General Tire & Rubber Co., Baytown, Tex. (Oct. '47)

Emmanuelli, Francois, Pres.-Gen. Mgr., S. N. Marep, 42 Rue La Boetie, Paris 8, France (Oct. '47)

Ennis, William S., Sales Engr., Wallace & Tiernan Co., Inc., Box 24, Jeffersontown, Ky. (Oct. '47)

Ferguson, Jack B., Gen. Foreman, City Water Dept., 2304 Greenland Ave., William Rd., Roanoke, Va. (Jan. '48)

Foil, S. L., Jr., Supt., Water Works, Pana, Ill. (Oct. '47)

Fuhrman, Ralph E., Supt., Sewage Treatment Plant, Blue Plains, Washington 20, D.C. (Oct. '47)

Fulmer, E. C., Service Engr., Electric Chemical Co., 812 Chestnut St., Parkersburg, W.Va. (Oct. '47)

Garrett, Arthur A., Hydr. Engr., U.S. Geological Survey, 5373 E. 2nd St., Long Beach 3, Calif. (Oct. '47)

Goddard, R. W., San. Engr., Dist. No. 2, Dept. of Natl. Health & Welfare, Box 296, St. John, N.B., Can. (Oct. '47)

Grant, Homer D., *see* Panhandle Construction Co.

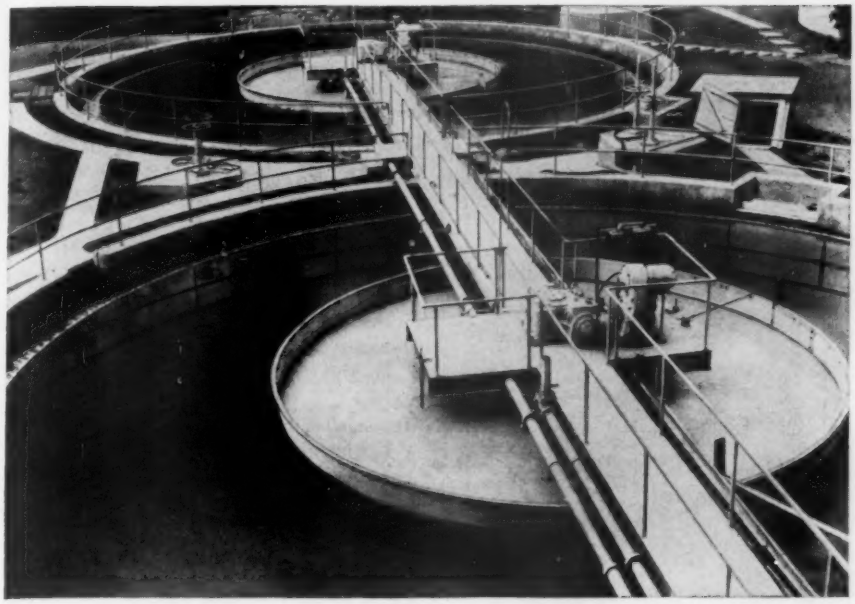
Grimes, L. A., Supt., Water Dept., City Hall, Abilene, Tex. (Oct. '47)

Hall, Harold E., Chief Operator, Northern Illinois Water Corp., 608 W. 12th St., Sterling, Ill. (Oct. '47)

Hatfield, C. R., Partner, Hatfield Eng. Co., 218 Oliver Eakle Bldg., Amarillo, Tex. (Oct. '47)

Hays, Paul J., City Engr., Williston, N.D. (Oct. '47)

(*Continued on page 32*)



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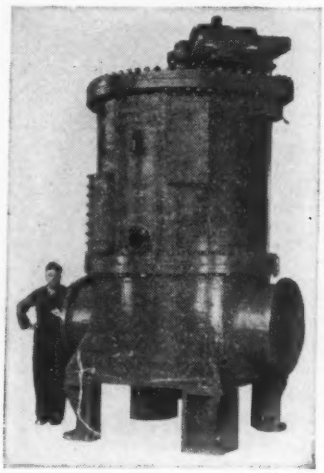

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(Continued from page 30)

Hoefer, Paul, Shop Foreman, Southwestern Public Service Com., 411 Roosevelt, Borger, Tex. (Oct. '47)

Hull, William J., Staff Consultant, Castle & Cooke, Ltd., Box 2990, Honolulu 2, Hawaii (Oct. '47)

Hutson, Ernest R., Asst. Supt., Water Dept., Brownfield, Tex. (Oct. '47)

Izquierdo, Fausto Perez, Asst. Prof., Univ. of Havana, Neptuno 910, 2o. Piso, Havana, Cuba (Jan. '48)

Johnson, J. M., Supt., Water & Sewer Dept., City Hall, Borger, Tex. (Oct. '47)

Jones, Richard Y., Cons. Engr., 209 Engineers Bldg., Joplin, Mo. (Oct. '47)

Lafontaine, Alcide, City Engr., City Hall, Valleyfield, Que., Can. (Oct. '47)

Lee County Health Dept., R. G. Thomas, San. Engr., 123 E. 1st St., Dixon, Ill. (Corp. M. Jan. '48)

Lily, J. C., City Auditor, Accounting Dept., Amarillo, Tex. (Oct. '47)

Louth, Elmer D., Supt., Purif. & Pumping, Water Works, R.R. No. 2, Fairfield, Iowa (Oct. '47)

Lundy, Thomas E., Design Engr., Koch & Fowler, 701 Great National Life Bldg., Dallas 1, Tex. (Oct. '47)

Mapes, Joe B., Resident Engr., Freese & Nichols, Engrs., Box 3596, Amarillo, Tex. (Oct. '47)

McCollister, C. W., Sales Engr., Layne Ohio Co., 1100 Town St., Columbus, Ohio (Oct. '47)

McIntire, James N., Chemist, American Viscose Corp., Parkersburg, W.Va. (Oct. '47)

(Continued on page 34)

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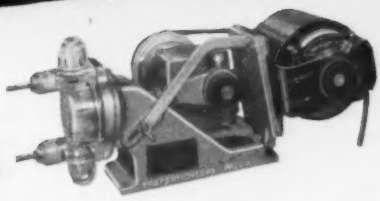

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(*Continued from page 32*)

McKown, Paul, Chief Operator, Cactus Oil Plant, Dumas, Tex. (Oct. '47)

Meigs, W. H., Chemist, Phillips Petroleum Co., Box 989, Oklahoma City, Okla. (Oct. '47)

Meredith, A. A., City Mgr., Borger, Tex. (Oct. '47)

Middleton, Leon, Supt., Water Works, Quitaque, Tex. (Oct. '47)

Miller, George C., Chief Engr., Water Works, Cedar Rapids, Iowa (Oct. '47)

Miller, James G., Pumps & Sewer Dept., Canadian, Tex. (Oct. '47)

Millikin, Joseph P., Chemist, City Water Dept., 2208 Berkeley Ave., S.W., Roanoke, Va. (Jan. '48)

Mountain Water Co., E. S. Souter, Supt., 2908 Foothill Blvd., La Crescenta, Calif. (Corp. M. Oct. '47)

Murphy, Alvin R., Field Engr., Wallace & Tiernan Co., Inc., 922 Hamilton Bank Bldg., Knoxville, Tenn. (Jr. M. Oct. '47)

New Mexico, University of, Ross P. Thomas, Supt. of Utilities, Albuquerque, N.M. (Corp. M. Oct. '47)

Owens, James B., Supt., Fairfax Hydraulics, Inc., Box 590, Arlington, Va. (Oct. '47)

Panhandle Construction Co., Homer D. Grant, Vice-Pres., Box 1500, Lubbock, Tex. (Assoc. M. Oct. '47)

Patterson, Archibald O., Dist. Engr., U.S. Geological Survey, Water Resources Branch, Box 607, Ocala, Fla. (Oct. '47)

Pietermaritzburg, City of, D. H. Darvill, City Engr., City Hall, Pietermaritzburg, Natal, South Africa (Corp. M. Oct. '47)

Prather, J. Arthur, Local Mgr., Potomal Light & Power Co., Shepherdstown, W.Va. (Affil. Oct. '47)

Rauscher, John F., Engr., City Water Dept., City Hall, Tucson, Ariz. (Oct. '47)

Reagan, J. C., Water Supt., Canadian, Tex. (Oct. '47)

Runyan, Damon O., Cons. Engr., Longmont, Colo. (Oct. '47)

Russell, Jess L., Resident Engr.-Mgr., Russell & Axon, Old 3rd Bank Bldg., Union City, Tenn. (Oct. '47)

Scanlan, Edward J., Diesel Sales Mgr., James W. Bell Co., Inc., 1720 I Ave., N.E., Cedar Rapids, Iowa (Oct. '47)

Schermerhorn, E. L., Supt., Dept. of Water Works, La Grange, Ind. (Oct. '47)

Schmidt, Victor R., Jr., Distr. Engr., City of Austin, Municipal Bldg., Austin, Tex. (Oct. '47)

Schonhardt, J. W., Supt., Water & Sewer Dept., Marshall, Tex. (Oct. '47)

Sealy, W. E., Water Supt., City Hall, Lamesa, Tex. (Oct. '47)

Sears, Dow I., Borough Mgr., Water Dept., 348 High St., Pottstown, Pa. (Oct. '47)

Sells, John H., Sr. Operator, U.S. Rubber Co., Philrich Branch, Box 2142, Borger, Tex. (Oct. '47)

Shaffer, Hugh C., Field Engr., Uhrick Supply Co., Box 397, Lyndon, Kan. (Oct. '47)

Sheanon, J. E., Supt., Water & Light Dept., Box 524, Wynnewood, Okla. (Oct. '47)

Shirley, L. E., Partner, Harrison, Shirley & Harrison, Box 2526, Amarillo, Tex. (Oct. '47)

Showalter, F. L., Pres., F. L. Showalter, Inc., 1607 Allied Arts Bldg., Lynchburg, Va. (Oct. '47)

Smith, M. R., Jr., Partner, Parkhill, Smith & Cooper, Cons. Engrs., Lubbock, Tex. (Oct. '47)

Souter, E. S., *see* Mountain Water Co.

Sprigman, Charles J., Chief Chemist, Utilities Lab., Socony-Vacuum Oil Co., Inc., Paulsboro, N.J. (Oct. '47)

Strickland, L. E., Meter Dept., 401 E. Wright, Marshall, Tex. (Oct. '47)

Thain, Andrew E., Water Dept., Box 52, Neosho, Mo. (Oct. '47)

Thomas, R. G., *see* Lee County Health Dept.

Thomas, Ross P., *see* New Mexico, Univ. of

Tomkinson, P. K., Intake Supervisor, Phoenix Water Dept., Ft. McDowell, Ariz. (Oct. '47)

Wesson, Clyde A., Mgr. & Vice-Pres., Sunny Slope Water Co., 1040 El Campo Drive, Pasadena 10, Calif. (Oct. '47)

(*Continued on page 36*)

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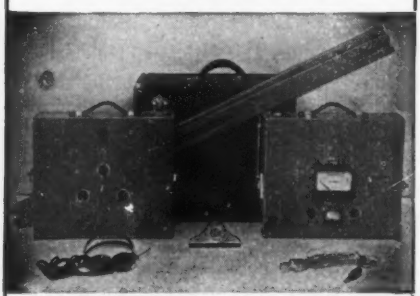

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(*Continued from page 34*)

Wilson, Edward F., Chemist, State Board of Health, Capitol Ground, Little Rock, Ark. (Oct. '47)

Zumwalt, Murray G., Water Service Employee, Southern Pacific R.R. Co., Nogal, N.M. (Oct. '47)

REINSTATEMENTS

Burnham, Lyle M., Sales Engr., Viking Supply Co., 2625 Elm St., Dallas, Tex. (Oct. '40)

Burns, Thomas M., Asst. Mgr. of Sales & Eng., American Locomotive Co., 30 Church St., New York 8, N.Y. (Apr. '35)

Carver, Andy, *see* Carver Stimpson Pipe Cleaning Co.

Carver Stimpson Pipe Cleaning Co., Andy Carver, Mgr., Walters, Okla. (Assoc. M. Oct. '45)

Daugherty, A. B., Supt., Water Works, Box 215, East Gary, Ind. (Jan. '41)

George, Lloyd, Salesman, Mueller Co., 5755 Wildwood, Indianapolis, Ind. (Apr. '40)

Hawley, J. J., Sales Service, Hersey Mfg. Co., 2215 S. Calhoun St., Fort Wayne 5, Ind. (Apr. '43)

Whitley, F. H., Lt. Col., MSC, Headquarters 1st Army, Office of the Surgeon, Governors Island, New York 4, N.Y. (Jan. '39)

LOSSES

Deaths

Evans, Edwin Ronald, Asst. Engr., Canadian National Ry., Moncton, N.B., Can. (Jan. '44) *MP*

Gibson, James E., Mgr. & Engr., Water Dept., 14 George St., Box 829, Charleston, S.C. (May '22) *Trustee '25–'26. Vice-Pres. '27. President '28. Diven Medal '29. Exec. Com. '29–'30. Director '30–'31. Honorary M. '40. Fuller Award '41. AMP*

Miller, Russell, Supt., Water & Light Plant, Amory, Miss. (Apr. '30) *MP*

Resignations

Burrill, Harold G., Partner, Burrill & Gwin, Cons. Engrs., 11 E. 21st St., Baltimore, Md. (July '44) *AMP*

(*Continued on page 38*)

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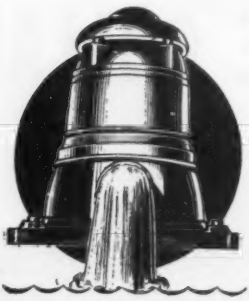

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(*Continued from page 36*)

Carnegie, S. Steve, Public Health Engr., State Dept. of Health, 5000A Dalrymple Drive, Baton Rouge, La. (Oct. '45) *P*

Gill, Sidney R., Northwest Dist. Sales Mgr., Northwest Lead Co., 2700—16th Ave., S.W., Seattle 4, Wash. (July '43) *MP*

Hogan, John Phillip, Partner, Parsons, Brinckerhoff, Hogan & Macdonald, 142 Maiden Lane, New York 7, N.Y. (June '20) *P*

Oshawa Public Utilities Com., G. F. Shreve, Gen. Mgr. & Secy., 100 Simcoe St., S., Oshawa, Ont., Can. (Corp. M. Jan. '33)

Changes in Address

Changes received between October 5 and November 5, 1947

Adams, Thomas C., Cons. Engr., 242 S. 12th St., Salt Lake City 2, Utah (Apr. '46)

Anderson, Alfred B., R.F.D., Butler, N.J. (Jan. '47)

Baker, Ralph H., Jr., State Board of Health, Bureau of San. Eng., Box 210, Jacksonville 1, Fla. (Jan. '47)

Beauvais, Philip H., City Mgr., City Hall, Allegan, Mich. (July '46)

Blach, Frederick S., 696 Madison Ave., New York 21, N.Y. (July '44)

Bock, A. W., Box 7095, Fort Worth, Tex. (Oct. '39)

Canham, Robert B., National Canners Assn., 1739 H St., N.W., Washington 6, D.C. (July '47)

Carroll, John T., Worthington Pump & Machinery Corp., 400 W. Madison St., Chicago 6, Ill. (July '25)

Cathodic Rust Proofing Co., F. L. Sweet, Box 5072, San Antonio 1, Tex. (Assoc. M. Oct. '44)

Dice, R. C., Dice Chemical Co., 101 Court Ave., Des Moines 9, Iowa (Jan. '47)

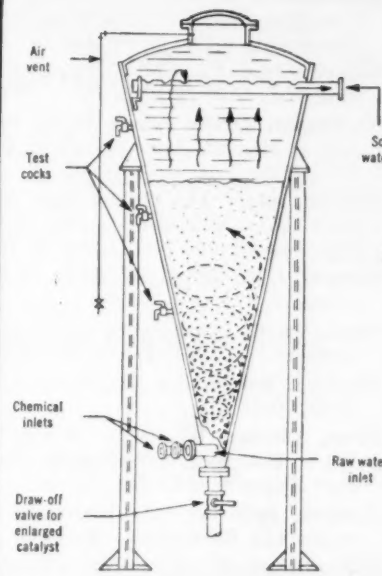
Dose, Herman W., 2709 N.W. 38th St., Oklahoma City, Okla. (Apr. '44) *M*

Everett, Jasper W., Vice-Pres., Springfield City Water Co., M.O.B. 709, Springfield, Mo. (May '22)

Frankhouser, Elmer V., 174 Glencoe Rd., Upper Darby, Pa. (Oct. '44) *AMP*

(*Continued on page 40*)

PERMUTIT'S sludgeless cold lime SPIRACTOR



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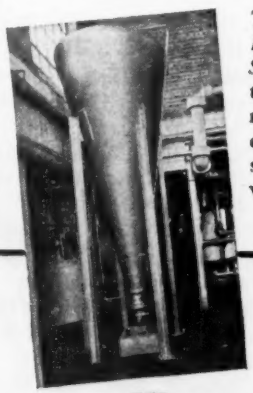

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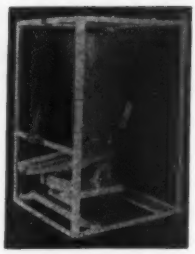

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(*Continued from page 38*)

Gard, Charles M., 116½ E. High St., Bryan, Ohio (Oct. '41) *AMP*

Hendricks, Gerald F., San. Engr., State Board of Health, 604 Franklin St., Columbus, Ind. (Jan. '46)

Herrmann, A. J., Branch Mgr., American Cast Iron Pipe Co., 916 Walnut St., Kansas City 6, Mo. (July '44)

Hobson, Fred C., Civ. Engr., Spruce Pine, N.C. (Apr. '47)

Hochlerner, Tobias, Adams Hotel, Park Ave. at 21st. St., Miami Beach 39, Fla. (May '30)

Horandt, Henry, Vice-Pres. & Mgr., New York Water Service Corp., 515 Ocean Ave., Brooklyn 26, N.Y. (June '29) *AM*

Hoskins, J. K., 6318 Woodside Pl., Chevy Chase 15, Md. (July '35) *P*

Hunt, Asa E., Mfrs. Repr., 1708½ Commerce St., Dallas 1, Tex. (Jan. '44) *P*

Jernigan, Harold, Box 362, Union City, Tenn. (Oct. '35)

Keen, Chester W., Supt., Waynedale Water Co., Inc., 6509 Liberty Drive, Fort Wayne 6, Ind. (Jan. '43) *M*

Kimball, Jack H., 1412 Westwood St., Santa Ana, Calif. (Apr. '44) *AMP*

Lake, George W., Hydr. Engr., Dept. of Lands & Forests, Water Rights Branch, Victoria, B.C., Can. (Apr. '47)

Levine, Max, Territorial Board of Health, Honolulu, Hawaii (Nov. '21)

Lilue, Enrique E., Chief Engr. & Supt., Water Works, Box 486, Caracas, Venezuela (Oct. '39)

Linderman, S. E., Exec. Vice-Chairman, Cast Iron Pipe Institute, 1006 Warner Bldg., Washington 4, D.C. (Jan. '37) *M*

Loveless, Roger W., Assoc., Alden E. Stilson & Assoc., Ltd., 209 S. High St., Columbus, Ohio (Oct. '46)

Ludwig, A. Muriel (Mrs.), Peerless Overseas Corp., 1412 Broadway, New York, N.Y. (July '43)

MacDonald, Frank P., Gen. Mgr., Central Div., Electro Rust-Proofing Corp., 1229 W. Washington Blvd., Chicago, Ill. (Jan. '43)

MacKenzie, Vernon G., 798 Worcester St., Wellesley, Mass. (July '43)

Marchand, Robert A., Water Purif. Plant, 508 Summit St., S.W., Warren, Ohio (Oct. '47)

(*Continued on page 42*)

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(*Continued from page 40*)

Mathisen, P. J., 374 W. Santa Clara Ave., San Jose, Calif. (July '46)

McCarthy, Gerald T., 1306 Marion St., Scranton 9, Pa. (Apr. '42)

Milaeger, Ralph E., Milaeger Well Drilling Co., 4630 W. Burleigh St., Milwaukee 10, Wis. (Apr. '47)

Morrill, Arthur B., Sr., National Institute of Health, 1 Haungpu Rd., Nanking, China (Oct. '25) *P*

Nau, Henry H., Utility Engr., Water Dept., 2101 Stillman Ave., Corpus Christi, Tex. (July '47)

Parrish, Dorothy M. (Mrs.), U.S. Geological Survey, Water Resources Branch, Washington 25, D.C. (Oct. '44) *P*

Pierce, E. W., Peerless Pump Div., Food Machinery Corp., 4554 N. Broadway, Chicago 40, Ill. (Jan. '45)

Robinson, Milton C., 1441 N.E. 80th Ave., Portland 16, Ore. (Oct. '46)

Saunders, Edward F., 115 E. 11th St., Tulsa, Okla. (July '46)

Steel, Ernest W., Instituto Nacional de Obras Sanitarias, Piso 5, Caracas, Venezuela (Apr. '47)

Stilson, Alden E., Chairman, Alden E. Stilson & Assoc., Ltd., 209 S. High St., Columbus, Ohio (July '44) *AP*

Stitt, L. W., Jr., Chief Chemist, Rathbun Co., Box 6056, Houston 6, Tex. (Jan. '46) *P*

Streander, Philip B., Cons. San. Engr., 120 Tremont St., Boston 8, Mass. (Dec. '23) *P*

Tykosky, Victor J., 4597 Hammond Ave., Detroit 10, Mich. (July '47)

Vicini, H. C., 950 Bendix Bldg., 1206 S. Maple Ave., Los Angeles 15, Calif. (Jan. '40) *M*

Walling, Ernest, Engr., Water Works, 23 Queen's Ave., Leamington, Ont., Can. (Jan. '46) *MP*

Ward, Sylvester E., Supt., Somerville Water Co., Pumping Station, Somerville, N.J. (Jan. '43) *MP*

Weaver, Herbert L., Assoc., G. W. Stephens Jr. & Assoc., 5 McCurdy Ave., Towson 4, Md. (Oct. '42) *P*

Wood, James, 58 Dwyer Ave., Liberty, N.Y. (Apr. '37) *P*

Zadigan, Ruben, National Brewers' Academy, 315—4th Ave., New York, N.Y. (Oct. '42)

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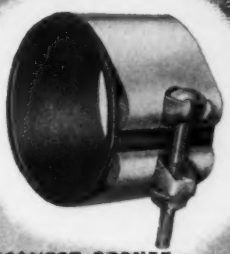

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(*Continued from page 22*)

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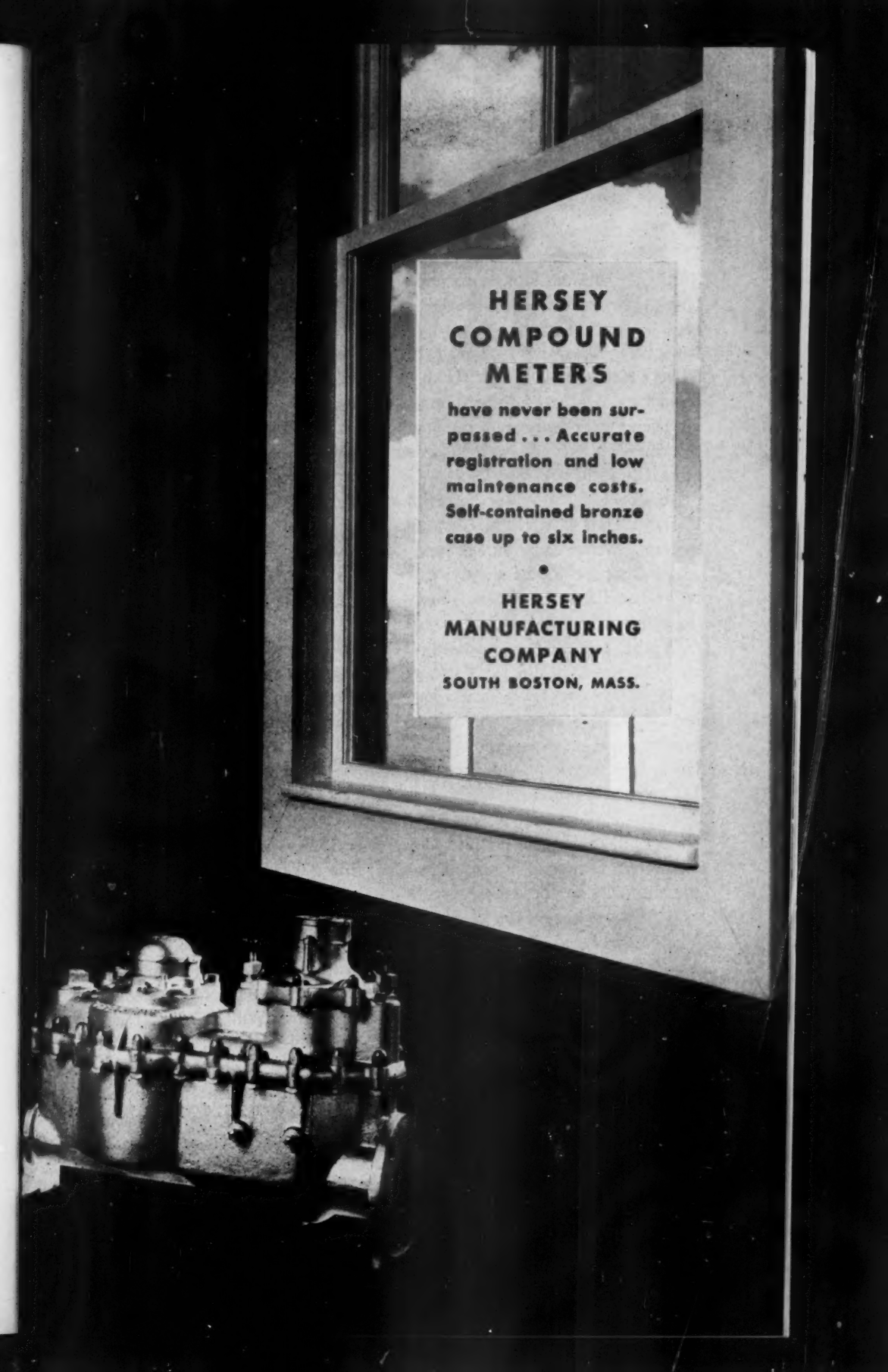
"Shareholders of the Pennsylvania Salt Mfg. Co. voted at the company's 97th annual meeting to change the present fiscal year—July 1 to June 30—to correspond with the calendar year, beginning January 1, 1948. . . . Leonard T. Beale, President, explained to shareholders that the new fiscal year simplifies accounting since it corresponds with the company's tax year, which is the calendar year." (*Pennsalt news release.*)

Happy New Years!

"The ABC's of Wrought Iron" is the title of a 20-page illustrated booklet issued by the A. M. Byers Co., Pittsburgh. In nontechnical terms, the booklet tells what wrought iron is; why it resists corrosion; how it is made; and how it is bent, welded and threaded.

Solvay Sales Corp. has announced the appointment of assistant branch managers in Detroit, Philadelphia and Syracuse. A. B. Kennedy will assume the newly established post at Detroit, K. M. Dillabough at Philadelphia and J. H. Kaiser at Syracuse. Each of the assistant managers has been a sales representative in his respective branch for several years.

(*Continued on page 46*)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(*Continued from page 44*)

IOWA SECTION MEETING

The city of Cedar Rapids played host, on October 9–11, 1947, to the 115 Active Members and guests who convened for the meeting of the Iowa Section. After an interesting and entertaining address of welcome by F. K. Hahn, Mayor of Cedar Rapids, the subject of "Ground Waters" was covered in panel discussion form by H. G. Hershey, Assoc. State Geologist, Iowa City; Theodore R. Lovell, Engr., Thorpe Well Co., Des Moines; and Gilbert Kelso, Prin. Water Analyst, Water Lab. Div., State Hygienic Lab., Iowa City. It was pointed out that the general deep well water table had not been lowered any appreciable amount in the state except in certain localities where the pumpage rate exceeded the rate of replenishment. H. F. Blomquist, Supt., City Water Works, Cedar Rapids, pointed out in a round table discussion on "A Water Superintendent's Problem in Face of Increased Costs" that it is advisable to increase water rates rather than neglect the system. Other contributors reported heavy main extension programs and agreed that the job of supplying the additions was most trying.

"The Effect of Recent Floods on Water Supply and Sanitation" was the title of a paper by J. A. Sampson, Asst. Public Health Engr., State Dept. of Health, Des Moines, who discussed the 1947 spring floods at Fort Dodge and Ottumwa. Dale L. Maffitt, Gen. Mgr., Water Works, Des Moines, and C. O. Alexander of Ames discussed wages and pensions in a way which aroused much interest and comment. It was pointed out that a good, actuarially sound pension system was one of the best ways to create friendly relationships between employee and employer. Paul Houser, of the Eng. Div., State Dept. of Health, Des Moines, observed, in a paper entitled "Stream Pollution Legislation," that the Iowa Legislature had made no changes in the stream pollution laws since 1924, and that there is now need for certain changes. He recommended that the Dept. of Health be granted the authority to prevent new pollution.

At a smoker on the evening of October 9, A.W.W.A. President N. T. Veatch discussed Association activities. During the business session, H. V. Pedersen, Supt. & Gen. Mgr. of Water Works, Marshalltown, was chosen to receive the Fuller Memorial Award. The officers elected to serve during 1948 were: Chairman—J. J. Hall, Supt., Water Dept., Dubuque; First Vice-Chairman—Roy O. Ellis, Mgr., Munic. Water Plant, Oskaloosa; Second Vice-Chairman—George A. Nelson, Supt., Boone; and Secretary-Treasurer—H. V. Pedersen. The Membership Committee reported that 24 new members had been added to the Section during the year and that enough applications had been received to bring the total above 100. A goal of 150 was set for the next year.

H. V. PEDERSEN
Secretary-Treasurer

(*Continued on page 48*)

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(*Continued from page 46*)

ROCKY MOUNTAIN SECTION MEETING

A registration of 92, considerably less than was anticipated, marked the meeting of the Rocky Mountain Section held in the Cosmopolitan Hotel, Denver, Colo., on Sept. 25 and 26, 1947.

A representative from Gov. Lee Knous welcomed the guests and brought to their attention a report on "Resource Development" submitted by a committee of which Robert Stearns, President, Colorado Univ., is chairman. The object of the committee is to promote the development of the Rocky Mountain area, and, of course, water has an important bearing on the economic advancement of the whole region. This relationship was also discussed by Harry E. Jordan, A.W.W.A. Secretary.

In the technical sessions, a paper on "Planning for the Future Water Needs of Your Community" was presented by John Burgess, Office Engr., Board of Water Comrs., Denver, in which criteria for estimating the character, location and amount of expected growth were presented. It was suggested that plans for growth ahead of anticipated demand be made general, so that alternative plans may be substituted if later developments should require changes, and that structures should be so planned that additions to them can conveniently be made later on. Carl M. Bennett, Director of Public Works and Planning, Grand Junction, Colo., in discussing this paper, offered a suggestion that population and water demand curves can be very helpful in forming estimates of future needs. Further comments on this paper were also offered by D. D. Gross, Chief Engr., Board of Water Comrs., Denver.

The use of general obligation bonds for water supply and revenue bonds for sewage treatment was advocated by H. E. Cramer, Vice-President, Mercantile Bank and Trust Co., Boulder, Colo., in a paper on "Municipal Financing." A motion picture entitled "Water," which was prepared and used by the Yakima, Wash., Water Dept. to promote the sale of bonds, was shown by Jack Davis, District Engr., Johns-Manville Sales Corp., Denver.

(*Continued on page 50*)

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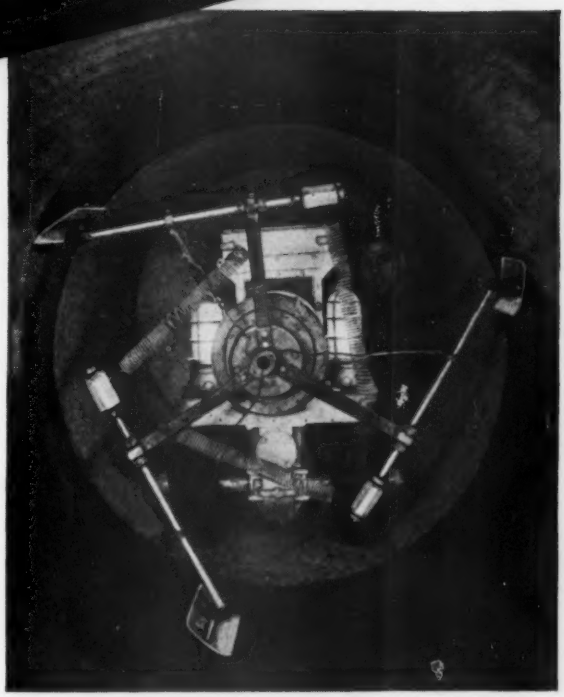

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(*Continued from page 48*)

A paper on "Ground Water Development, Conservation and Replenishment" was presented by E. W. Bennison, Office Manager, Edward E. Johnson, Inc., St. Paul, Minn., who warned that many wells are sunk without proper investigation, with the result that the wrong type of well or an unsuitable location is often selected.

The "Legal Aspects Concerning Water Rights and Municipal Water Works Officials" were discussed by Glenn G. Saunders, Asst. City Attorney, Denver, who discussed liability for damage, water rights and the legal obligations of maintaining a service once it is instituted.

At the business luncheon, Past Chairman W. V. Leonard presented the Chairman's pin to his successor, Maynard Graham, and D. D. Gross gave his report of board activities for the past year.

Elected as Section officers were: Chairman—George Nisbet, Supt., Water Dept., Palisade, Colo.; Vice-Chairman—Ernest Martinez, Manager, Water Dept., Taos, N.M.; Secretary-Treasurer—O. J. Ripple, Cons. Engr., Denver; and Trustee—Charles G. Caldwell, Director, Div. of San. Eng. and Sanitation, State Dept. of Public Health, Santa Fe, N.M.

"Minimum Requirements for Certification of Public Water Supplies for Common Carriers," as given in the U.S. Public Health Service Drinking

(*Continued on page 52*)

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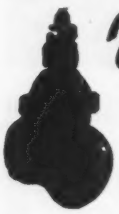

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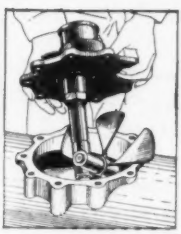

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(*Continued from page 50*)

Water Standards and adopted by the Colorado Legislature, was the subject of a paper by G. E. Rieppe, Director, Div. San. Eng., Colorado Health Dept. L. O. Williams Jr., Director, Div. of Public Health Eng. and Sanitation, State Board of Health, Cheyenne, Wyo.; Charles G. Caldwell; and Harry E. Jordan discussed the paper. A committee was appointed to work with the author in establishing a policy of enforcement of water standards.

George J. Turre, San. Engr., Board of Water Comrs., Denver, gave a talk on "Water Samples for Bacterial Examination and Chemical Analysis" in which he outlined the significance and importance of these measures to the safety of the water supply. There was a discussion of the paper by Charles T. Wright, Sr. San. Engr., U.S. Public Health Service, Denver, and W. V. Leonard, Industrial Hygienist, Cheyenne.

An interesting discussion of the "Importance of Maintaining Proper Fluorine Content in Drinking Water" was presented by Robert A. Downs, Director of Dental Hygiene, Colorado State Health Dept.; Dana Kepner, Manufacturer's Representative; J. O. Brown, Mgr., Pump and Eng. Dept., Crane O'Fallon Co.; W. B. Freeman, Mgr., Lock Joint Pipe Co.; W. Ballinger, Sales Engr., Armco Drainage and Metal Products, Inc.; Jack W. Davis, District Engr., Johns-Manville Corp.; and J. M. Warner, Waterworks Sales Co., all of Denver, discussed the "Status of Water Works Equipment and Supplies." The availability of cast-iron pipe was given as 14 to 15 months; brass valves, in small sizes, immediate; iron body valves, 6-10 in., 6 weeks; 12-14 in., 10 weeks; 16 in. and up, 16 weeks; dry feed machines, filter equipment, and Venturi meters, 16-20 weeks. Steel pipe was reported available in 5 months; concrete pipe 12 in. or over, 3-5 months; and asbestos-cement pipe, 300 days, unless production by a new factory reduces this figure.

The banquet, floor show, report of the Resolutions Committee and presentation of the Fuller Award to George J. Turre closed the meeting.

O. J. RIPPLE
Secretary-Treasurer

(*Continued on page 54*)

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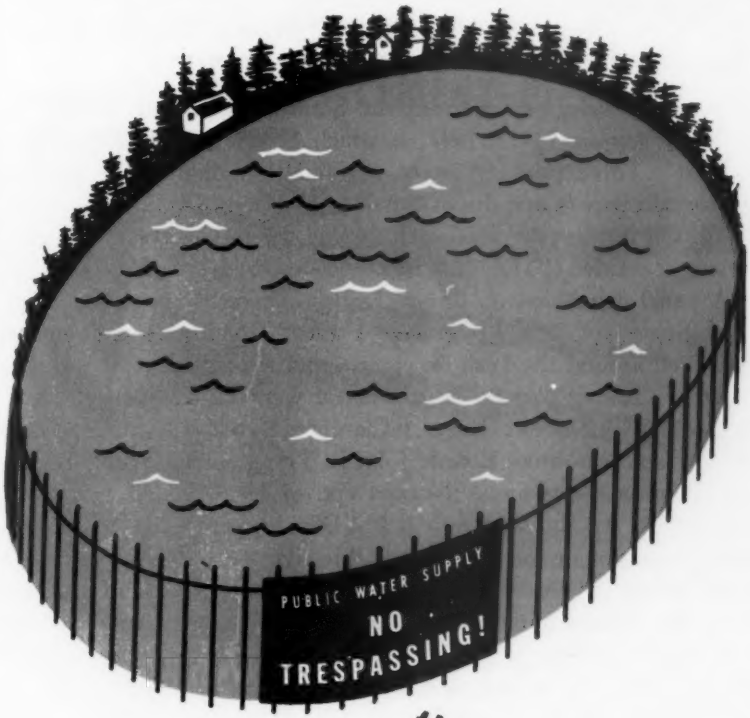

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(*Continued from page 52*)

SOUTHWEST SECTION MEETING

A total of 428 delegates attended the Southwest Section Meeting in Amarillo, Tex., October 12–15, 1947, at which City Manager N. V. Moss served as host. Three full days were devoted to well-attended sessions featuring program papers and discussions.

A.W.W.A. President N. T. Veatch opened the sessions with an interesting message entitled "The American Water Works Association at Work." A panel discussion on "State Legislation on Control of Underground and Surface Water Resources—Present Conditions and Future Needs" revolved around the laws on control and management of water in the four states. Taking part in the discussion were E. V. Spence, Chairman, Texas Board of Water Engrs.; Clarence Burch, Chairman, Oklahoma Planning and Resources Board; John E. Trygg, Chief, Water Supply and Water Disposal Section, Louisiana Dept. of Health; and Harold B. Foxhall, Geologist, Arkansas Resources and Development Com.

A panel discussion on the "Aims and Objectives of the Texas Construction Council" presented three papers by C. P. Dodson, Mayor of Decatur, representing the municipalities; H. R. F. Helland, Cons. Engr. of San Antonio, for the engineers; and Homer D. Grant of the Panhandle Construction Co., Lubbock, for the contractors. All three agreed on the advantages of such an organization. The council is composed of fifteen members, five from each of the sponsoring organizations: the League of Texas

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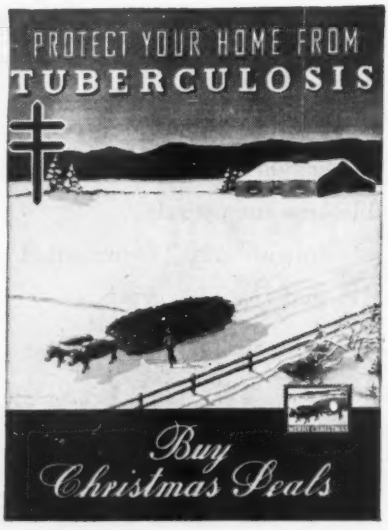

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"GREAT RELIEF TO GET MAINTENANCE-FREE LINE"

Service connections or connections to other types of pipe are easy with "Century" Asbestos-Cement Pipe.

These are just a few typical comments taken from K&M files on "Century" Asbestos-Cement Pipe. Engineers all over the country have found that "Century" offers a combination of good points that no other type of pipe can offer.

For instance they've found they can hold pumping and maintenance costs to rock bottom with "Century" Pipe. Being non-metallic, "Century" is entirely immune to corrosion, electrolysis and tuberculation. Its Williams and Hazen "C" of 140 remains the same indefinitely.

Engineers have also realized faster, more economical installation, thanks to "Century" Pipe's light weight, long 13' lengths and quickly assembled couplings. They've found that "Century" is strong enough to withstand vibration, traffic and other tough conditions. And, since it grows tougher with age, its salvage value is 100%. Write for further details about "Century" Asbestos-Cement Pipe.

Nature made Asbestos . . .
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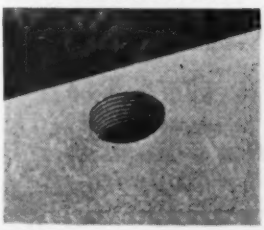
Can be drilled and tapped in the field. Note clean-cut threads.



Can be cut on the job.

Easy to handle without mechanical equipment.

(*Continued from page 54*)

Municipalities, the Texas Society of Professional Engineers and the Contractors Association. During the short period of its existence the council has been able to develop sound and proper planning, standard contracts and specifications for public works, and other features—all beneficial to the common interest.

In a paper entitled "Stand-by and Ready-to-Serve Charges for Water Service," David Pfeiffer, Assoc. Prof. of Mech. Eng., Southern Methodist Univ., Dallas, Tex., outlined a suggested rate structure which would include a service charge, despite public resistance. B. B. Harris, Dean of Administration, North Texas State Teachers College, Denton, Tex., collaborating with J. K. G. Silvey, presented a most interesting treatment of the subject of "Algae Control in Fresh Water or Municipal Reservoirs of the Southwest." Among their suggestions for the successful operation of reservoirs to maintain a biological balance, the authors strongly recommended that fishing be permitted in water supply reservoirs.

A demonstration of the properties of liquid air was presented by C. W. Seibel, Supervising Engr., U.S. Helium Plants, Amarillo. Following the demonstration the entire group made an inspection trip to the helium plants, ending the day with a barbecue at Mayor Hagy's ranch.

(*Continued on page 60*)

- Saves 75% of costs
- Goes 4 times as far
- Eliminates caulking
- Needs no large bell holes
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Immediate shipment. FREE: Illustrated catalog.

Producers also of M. H. Brand Caulking Lead

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Prevent Rusting

Rusta Restor cathodic protection, provides *permanent protection* against rusting of water tanks, piping and steel structures of all kinds.

Initial cost of a complete equipment is about equal to the cost of a good paint job. . . . Operation costs only about 2 mills (i. e. $0.002) per year per square foot of surface protected.

If your tanks and steel structures are not now protected by this proven low cost method, they should be. No obligation. Send for fully descriptive literature today.

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Look into that pipe

to increase water pressure

When pumping costs rise, pressures fall, and capacity goes down—it's a sign of clogged water pipes.

Many a pipe, assumed to be in good operating condition, is actually delivering less than half of its normal capacity. It pays to investigate.

The highly specialized methods and equipment of the National Water Main Cleaning Co., developed over a period of more than 40 years, enables us to clean any main thoroughly and economically with but little interruption to service.

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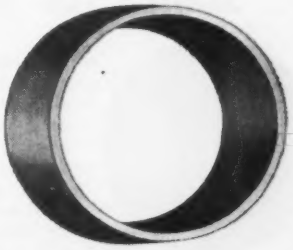

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PUTTING SCIENCE TO WORK

The ring test is a scientific method for determining the modulus of rupture of pipe. It is not a required acceptance test but one of the additional tests made by cast iron pipe manufacturers to ensure that the quality of the pipe meets or exceeds the requirements of standard specifications.

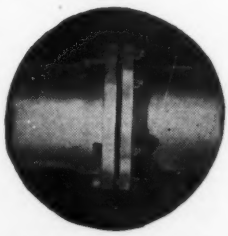
A ring, cut from random pipe, is subjected to progressively increased crushing load until failure occurs. Standard 6-inch cast iron pipe, for example, withstands a crushing weight of more than 14,000 lbs. *per foot*. Such pipe meets severe service requirements with an ample margin of safety.

Scientific progress in the laboratories of our members have resulted in higher attainable standards of quality in the production processes. By metallurgical controls and tests of materials, cast iron pipe is produced today with precise knowledge of the physical characteristics of the iron before it is poured into the mold. Constant control of cupola operation is maintained by metal analysis. Rigid tests of the finished product, both acceptance tests and routine tests, complete the quality-control cycle. But with all the remarkable improvements in cast iron pipe production, we do not forget the achievements of

Joints for Cast Iron Pipe

Bell-and-Spigot Joint: the standard joint for water and sewerage service.

A variety of joints are available, of which the two most widely used are illustrated. Special purpose joints such as the Ball-and-Socket, or Flexible Joint for underwater use, and the Flanged joint for above-ground use, are also available.



Mechanical Joint: bottle-tight and flexible, now with interchangeable parts.

CAST IRON PIPE

TO PROTECT PIPE QUALITY

the early pipe founders as evidenced by the "Survival and Retirement" report recently published by the A. W. W. A. Of all the cast iron pipe laid in the 25 cities studied, some as early as 1817, more than 96 per cent of all pipe, 6 inches and over, is still in service.

"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

"SILENT SERVICE is not enough"—A.W.W.A.

The American Water Works Association is recommending to its members, for local action, a sound, well-planned program of Public Relations publicity and advertising. It is based on the premise that good water service, like good health, is too often taken for granted, in which case favorable public opinion is dormant.

To co-operate with this program and help to arouse national recognition of the efficient service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* readers of "Time" and "Nation's Business" throughout 1947.

For example, the following human-interest cartoon and excerpts from a current advertisement

"biggest penny in the world"

It buys you more than 500 glasses of safe, palatable water supplied by your public water supply system. Yes, the penny you spend for that indispensable service—*water* service—has the highest purchasing power in the world. Less than ten of them buys 300 gallons (average daily family consumption) delivered to your faucets. Yet few of us stop to consider that this convenient, reliable, low-cost service is due to the efficiency of America's public water supply systems.

Another big reason for the low cost of water is cast iron pipe because of its low maintenance cost and unequalled long life.

A good water supply rarely receives public recognition because, like good health, it is taken for granted. But it is the community's greatest asset, guarding health, life and property.

Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 So. Michigan Avenue, Chicago 3, Illinois.

SERVES FOR CENTURIES

(*Continued from page 56*)

Axel Fabrin, Pump Designer for Layne and Bowler Co., Memphis, Tenn., emphasized in his paper, "Selection of Well Pumps," the improvements made in design to increase efficiencies and prevent corrosion. "Taste and Odor Control" at the Shreveport, La., plant was the subject of another paper, by B. G. Cole, Chem. Engr. of that city's Water Dept.

Another three-way discussion, this time on "Public Relations," was presented by Rex Webster of the advertising agency of Buckner, Craig and Webster, Lubbock, who gave the customer's side of the story; Miss Opal Seay, Cashier, Water Works, Lubbock, who represented the employee's point of view; and M. B. Cunningham, Supt. and Engr., Water Dept., Oklahoma City, Okla., for the managers. A group breakfast session at which varied problems were discussed under the direction of A. H. Ullrich, Chem. Engr., Water Dept., Fort Smith, Ark., was a new feature of the meeting. The sessions concluded with the showing of the motion picture "Life Stream," which was furnished through the courtesy of Melvin P. Hatcher.

At the business meeting the following officers were elected: Chairman—George H. West, Water Plant Supervisor, Gulf State Utilities Co., Lake Charles, La.; Vice-Chairman—Delbert W. Robinson, Supt., Water and Gas Depts., Community Public Service Co., Fort Worth, Tex.; Trustees—(Arkansas) Jay Medlen, City Comr., Dept. of Public Works, Fort Smith; (Louisiana) Nezem J. Lorio, Supt. Water Works, Marrero; (Oklahoma) Curtis E. Moutrey, Supt. of Filtration, Tulsa; and (Texas) Noble V. Moss, Supt., Water Dept., Amarillo. The incoming board appointed a Publication Committee consisting of Robert W. Harding, Chairman, and Fred H. Puckhaber and J. R. Pierce. Announcement was made of the Fuller Award, which went to Albert H. Ullrich for his splendid leadership in all Association activities.

LESLIE A. JACKSON
Secretary-Treasurer

WEST VIRGINIA SECTION MEETING

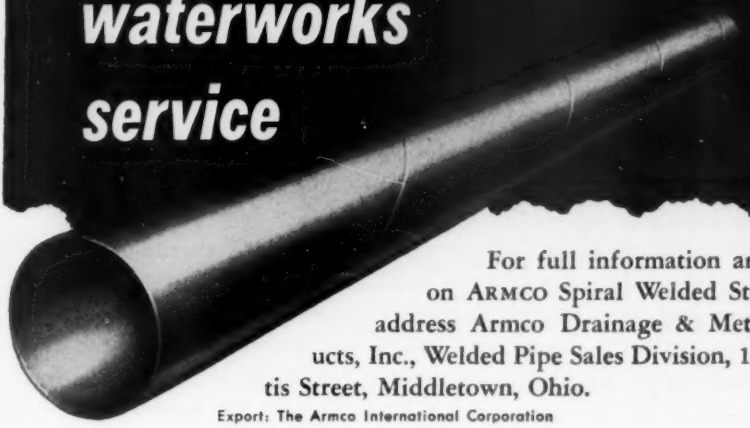
The joint meeting of the West Virginia Section and the Conference on Water Purification was held on October 2–3, 1947, at the Hotel West Virginian in Bluefield. Concurrently with the Section Meeting, the first meeting of the West Virginia Sewage and Industrial Wastes Assn. was also held. The registration of 120 represents a 15 per cent decrease from the normal, but an analysis of the registration list shows the decline to be caused by a decrease in the number of manufacturers' representatives attending. This was the first meeting to be held in the extreme southern part of the state.

At the business meeting the first day, the following officers were elected for 1948: Chairman—Dennis Clark, Mgr., West Virginia Water Service

(*Continued on page 62*)

THIS STEEL WATER PIPE does not crack under pressure*

...nor from shock, soil shifts or temperature changes in normal waterworks service



For full information and prices on ARMCO Spiral Welded Steel Pipe, address Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1495 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation

*Ultimate strength, 50,000-60,000 psi.; yield strength, 30,000-40,000 psi.; elongation in 2 inches, 30%.

ARMCO

ARMCO STEEL PIPE

(*Continued from page 60*)

Co., Welch; Vice-Chairman—J. A. Samples, Chief Chemist, Weirton Steel Co., Weirton; Secretary-Treasurer—J. B. Harrington, Director, Div. of San. Eng., State Dept. of Health, Charleston; and, as Trustees—(1948) Max K. Jones, Mgr., Huntington Water Corp., Huntington; (1949) William S. Staub, Div. Engr., West Virginia Water Service Co., Charleston; and (1950) S. H. Davis, Mgr., Water Works, McMechen.

At the annual banquet, which 150 persons attended, it was announced—appropriately enough by Perkins Boynton, Supt. of Filtration, Clarksburg, who for a long period had known George W. Fuller—that the Fuller Award would be granted to Arthur R. Todd, Supt. of Filtration, Warwood Filtration Plant, Wheeling.

The first technical session, over which H. Cable Cramer, Mgr., Catlettsburg, Kenova and Ceredo Water Co., Kenova, presided, was opened with a welcoming address by A. Harry Vest, Mayor of Bluefield, to which Chairman Cramer responded. A paper on "Short Cuts and Labor-Saving Kinks" was delivered by Nick Leshkow, Mgr., West Virginia Water Service Co., Princeton, who described several practical procedures he had found useful in managing a water system in a small city. A.W.W.A. Vice-President Linn H. Enslow presented a talk entitled "Looking Ahead With the American Water Works Association." A practical and timely paper, "Know Your Valves and Hydrants," by A. G. Scheinert, Rensselaer Valve Co., Pittsburgh, concluded the morning session.

At the next session Frank Offutt, Supt., Water Works, Williamson, described "Intake and Plant Improvements" at that city. The address which followed, "Engineering Pays Dividends in Small Water Systems," by W. D. Kelley, Cons. Engr., Charleston, elicited considerable discussion. In a paper entitled "Maintenance of Zeolite Beds," Perkins Boynton discussed two common problems in softening. H. F. Johnson, Resident Geologist, Ground Water Div., U.S. Geological Survey, Morgantown, reviewed the current status of "Ground Water Investigations in West Virginia." Arthur R. Todd then reviewed "Recent Developments in Water Treatment."

The final technical session consisted of a guided discussion on the subject "Keeping Costs Down," with William S. Staub as discussion leader, and was followed by a general discussion developed from questions submitted from the floor. It was unfortunate that attendance at the final session was reduced by the departure of many before the meeting adjourned. In future meetings the open forum sessions will be better scheduled.

A choice of three inspection trips was made available to the registrants: Exhibition Coal Mine, Pocahontas, Va.; Bluestone Sewage Treatment Works and Ada Filtration Plant, both at Bluefield, W.Va.

J. B. HARRINGTON
Secretary-Treasurer

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JOURNAL

AMERICAN WATER WORKS ASSOCIATION

VOL. 39, NO. 12 DECEMBER 1947

Water Works Rules *Hatcher*

Applying Business Principles *Arnold*

Tests on Pipes Lined in Place
Banks, LaDue

Long Line Hydraulic Studies *Scobey*

Reducing Unaccounted-for Water
Haydock, Gustafson, Griffiths

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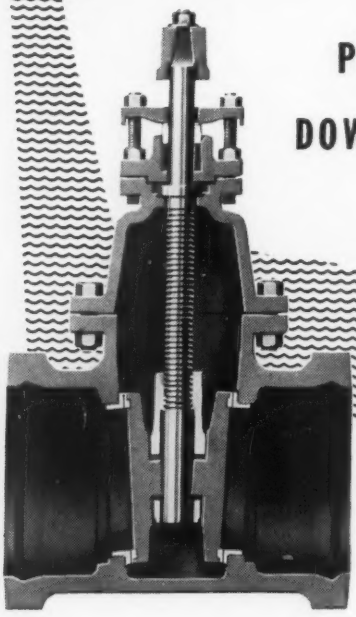

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R. D. Wood Gate Valves have built an enviable reputation under all sorts of conditions. Enviable, but not amazing—considering how they are built, and how they function. Just 3 moving parts to the internal mechanism; precision-made parts virtually wearproof in their action. The discs are lifted into the bonnet without friction, seated without distortion. Tight, leakproof contact is assured. No pockets to collect sediment and scale. No complicated parts to go wrong. Full capacity flow.

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